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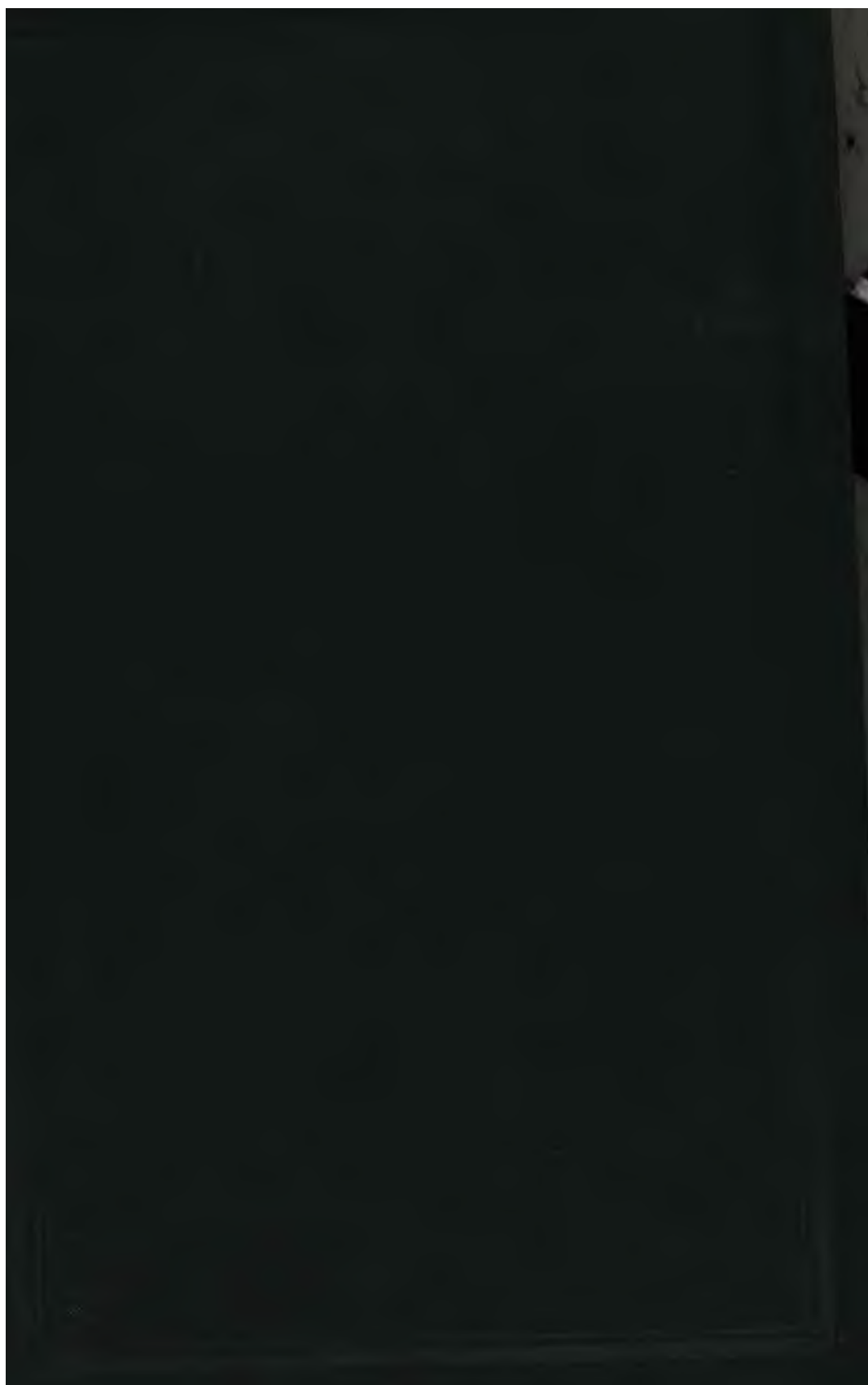
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MATTER FOR MATERIALISTS:
A SERIES OF LETTERS
IN VINDICATION AND EXTENSION
OF THE
PRINCIPLES REGARDING THE
NATURE OF EXISTENCE

OF
THE RIGHT REV. DR. BERKELEY,

LORD BISHOP OF CLOYNE.



BY
THOMAS DOUBLEDAY,

AUTHOR OF "THE TRUE LAW OF POPULATION," "THE FINANCIAL HISTORY OF ENGLAND," "THE POLITICAL LIFE
OF SIR ROBERT PEEL," "ST. MARK'S EVE," ETC., ETC.

"By supposing a substance wherein thinking, knowing, doubting, and a power of moving, etc., do subsist, we have as clear a notion of the substance of spirit as we have of body; the one being supposed to be (without our knowing what it is) the substratum to those simple ideas we have from without; and the other supposed (with a like ignorance of what it is) to be the substratum to those operations we experiment in ourselves, within."—*Locke on the Human Understanding, Book II., Chap. 23, P. 5.*

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TO

JOHN TAYLOR, ESQ.,

OF

E ARSDON, NORTHUMBERLAND,

THIS VOLUME

I S I N S C R I B E D

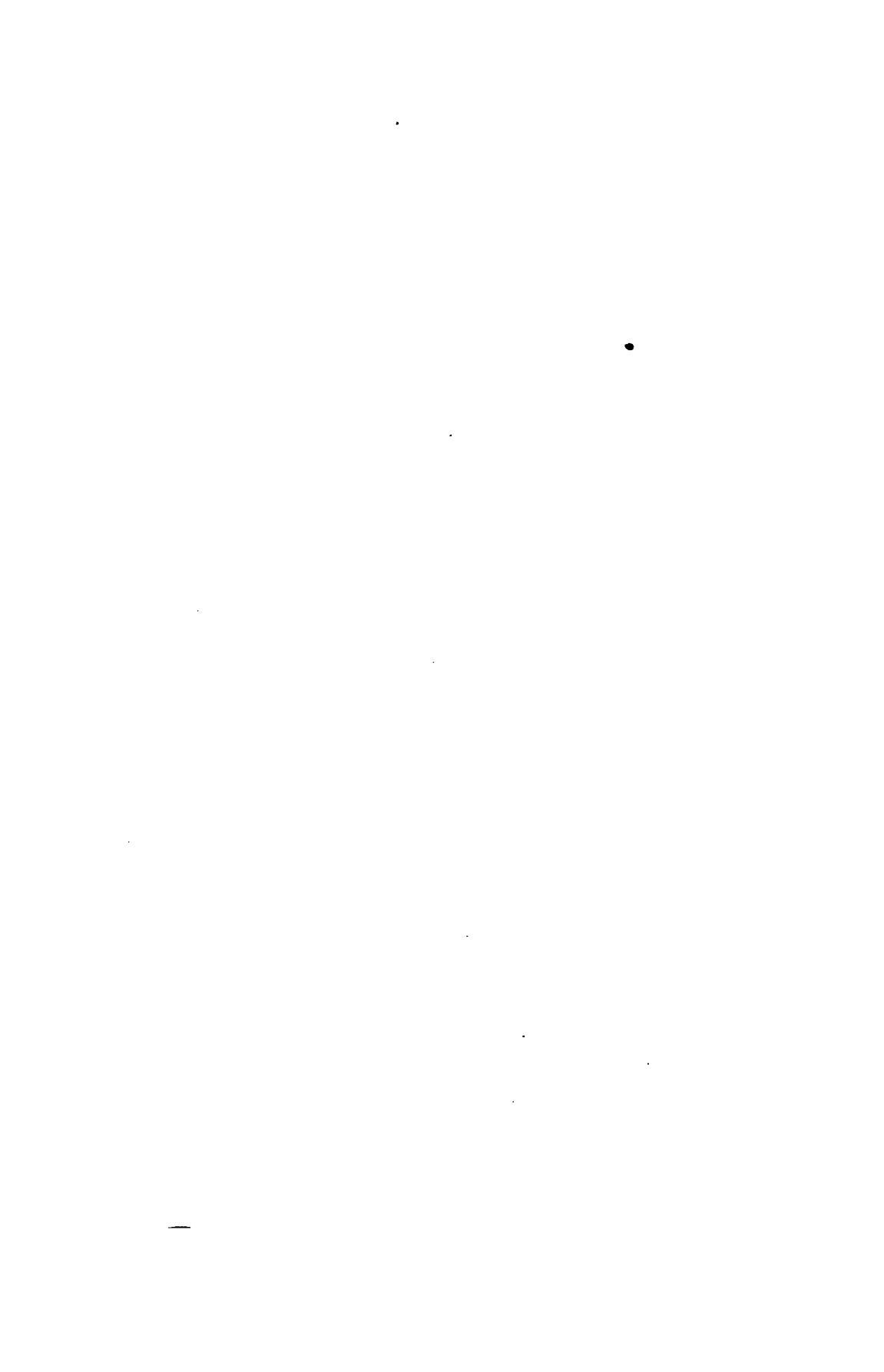
BY

H I S F A I T H F U L F R I E N D

A N D

O B L I G E D S E R V A N T,


THE AUTHOR.



P R E F A C E .

THE views, as to the Nature of Existence, which form the subject of the following pages, have never, for any long period, during a life of no short duration, been absent from the mind of their author. Moral philosophy, and most especially that portion of it which may be styled metaphysics proper, formed his earliest study. As a consequence of this, he became, at an early age, acquainted with the celebrated tract of the Bishop of Cloyne, "On the Principles of Human Knowledge," as well as with those dialogues which further illustrate the principles laid down in that famous treatise. It was not until late in life that he was enabled to read "The Theory of Vision" and "The Analyst," as well as the answer to "Walton," who had attempted to defend the fluxions of Newton from Doctor Berkeley's objections.

The first perusal of Doctor Berkeley's tract on human knowledge affected the mind of the author of the following letters as its first perusal probably affects most minds. It appeared to him so contrary to that which we are accustomed to call the evidence of our senses, and to all experience, and all ordinary belief, that his imagination, at once, revolted from any acquiescence in a doctrine with so much apparent absurdity on its face. He could not, at first, for a single moment,




conceive it to be true: and, however unanswerable the reasoning might be, he felt it, for a long time, utterly powerless to check, even for an instant, the total unbelief with which the perception of the theory was accompanied. He did not, at first, see and appreciate the import of the mistake which Doctor Berkeley has, beyond question, committed in trying to make out that his theory squares with vulgar notions as to the nature of phenomena. This mistake has, in all human probability, been the principal cause of the want of conviction, which most persons experience after studying the unanswerable reasoning of the Bishop. Every reader feels, instinctively, that even the subtle mind of Berkeley had here deceived itself. Every reader instinctively feels that externality, and the existence of space, and all that space seems to contain, is not only the belief of the vulgar, but, practically, of all men, including Berkeley himself. In short, no one can properly understand and appreciate the theory, laid down by the Bishop of Cloyne, without perceiving that the Creator has so provided that all men, in this stage of existence, shall act and speak as if space, matter, time, and motion were abstract realities, and not merely mental impressions. In practice he could not act as he might be expected to act if he really believed his own theory. To say, therefore, that his theory squared with the convictions and practice of the vulgar was a blunder. It did not square even with his own practice, nor with that of any human being whatsoever. But this is no argument against its truth. The whole theory of material existence, as commonly held, resolves itself into a system of mental discipline ;

and, to carry out that discipline, it is necessary that the man should act as if material existence were true in the abstract. This is the condition upon which rests that discipline of mind which is the plain purpose of this portion of our existence. This condition, therefore, cannot be evaded by any man; nor could Berkeley himself evade it, even for a single instant.

When the veritableness of the foregoing observations is once admitted, conviction, as to the abstract truth of the celebrated theory of Berkeley, becomes much more easy. The author, however, may be permitted to doubt whether any mind ever fully admitted and embraced that conviction, until the insuperable difficulties and contradictions which are involved in the opposite doctrine have been fully considered and understood. After that, it becomes almost impossible not to admit the conclusions to which the Berkeleyan doctrine conducts us. If we still hesitate, we must attempt to repose upon that chaos which Pyrrho and his followers styled "teaching;" and which may be summed up in the single sentence that nothing is certain but "universal uncertainty;" and that the only possible knowledge is to know that nothing can be known.

Such was the nature of the process which ended, at last, in the author's conviction that, ultimately, the material theory must be abandoned, and a theory of immaterial existence substituted. If it be said that any theory substituted for a material theory, can only amount to a set of unsupported assumptions, inasmuch as immaterial substance cannot be the subject of experiment, the author can only reply that this



objection is, itself, only an assumption, and that it cannot, in his opinion, be admitted.

It must be allowed, on all hands, by materialist and immaterialist, that we have bodily impressions, visible and tangible. We have that set of impressions which go to make up the compound idea of our own bodies; and that other set of impressions which constitute our ideas of the bodies of other human beings, as well as of the lower animals. If, then, we be absolutely driven to abandon the notions that these impressions have their source in material substances, we must, by the same necessity, be forced to conclude that they are the results of immaterial agency of some kind. And a mature consideration of the question ought to convince the candid enquirer that this alternative is the more probable of the two. It will be found, on investigation, that the results of all phenomena are purely mental, and reside in the effects they produce upon the mind which perceives them. This will be found to be true of the most remote, as well as of the most every-day and ordinary phenomena. Of what use, for instance, are the most remote phenomena which geology has to produce, except to indicate to the understanding that lower order of life and mind existed before man was placed in his present position, and subjected to the discipline of that which we know as human existence? Matter, then—assuming it to exist—is only of use as the medium of conveying mental impressions. To itself it cannot be of any use. If, then, these impressions may—as they certainly may—be conveyed to the mind either by the immediate act of God. or. mediately by

the ministration of lower orders of immaterial beings, matter becomes a superfluity; and, being so, its existence becomes, in the highest degree, improbable. Nor is it less easy to conceive the existence of an ascending scale of immaterial beings than to conceive an ascending scale of organisms, commencing with the simplest and ending with the most complex and highly gifted.

Such was the origin of the views, and such is the nature of the conclusions, attempted to be established in the letters which follow. It is with strong feelings of diffidence and hesitation that the author at length ventures to submit them to the eye of the public. No one can be more entirely aware than is the author of these pages of the utter feeling of blank incredulity with which the theory of Bishop Berkeley, when first stated, is invariably received, even by persons not unaccustomed to metaphysical speculations. So directly opposed is it to all ordinary notions, that there are intellects to which no clearness of statement can render it even comprehensible; nor even lessen, in the slightest degree, the almost involuntary sense of the ridiculous and absurd, by which a denial of material existence is invariably followed in the minds of those who hear it for the first time, or who have often heard without having reasoned upon it. Pope, who was a philosopher as well as a poet, went too far when he said—

“Coxcombs vanquish Berkeley with a grin.”

There is no need to be a “coxcomb” in order to be inclined to take that course. So decidedly is it in the teeth of all that we

are accustomed to call "common sense," and so completely is it, of necessity, ignored in the practice even of its own advocates, that if a first promulgation of the doctrine is followed by a laugh of incredulous amazement, no one ought to be aggrieved. This the author is quite ready to admit; but all this difficulty of believing does not, in the least, invalidate the real strength of the position.


If it be found that the assertion of material existence necessarily involves direct, and positive, and absolute contradictions, we are, at once, fixed in a dilemma. We must, perforce, do one of these three things. We must either hold that a hypothesis which involves positive contradictions may be true; or we must find some other hypothesis which does not involve contradiction; or we must remain suspended in a state of entire scepticism, with Pyrrho and Hume. If we take the first course, we cut from beneath us the foundation of all reasoning; for, if a theory involving contradictions may be true, then all contradictions may be admitted, and there is an end of all logic, and all ratiocination of any and every kind.

If we take the last course, we put the human mind into a situation in which it cannot remain for any length of time. A mind destitute of any belief as to the nature of existence may be compared to an animal in the state of hybernation, destitute of every function of life. In a state like that the activity of the human spirit will not permit it to remain. There is then only one path left. We must dismiss, as untenable, the whole hypothesis of material existence; and struggle onward

in the path first opened out and partly trodden by the illustrious George Berkeley, Lord Bishop of Cloyne, the most amiable of men, and the first of metaphysicians.

Having thus indicated, as distinctly as he could, the nature and scope of the reasoning relied upon in the composition of the following pages, the author leaves them in the hands of the reader. Should that reader revolt, at once, when asked to entertain propositions so strange, he would say "strike, but hear me!" Should he, as is more likely, incline to ridicule the attempt, the writer would merely remind him that liability to ridicule has long ceased to be held as "a test of truth."

Before concluding these preliminary remarks, the author deems it, in this case, requisite to add a few words in explanation of his motive for placing in his title-page a sentence from Locke, as a motto to the work which follows. He does not adopt this motto with any intention of leading the reader to conclude that he coincides in the propriety of the expressions used by Mr. Locke. He adopts it solely because it embodies the full and unhesitating confession of this illustrious man, of our entire ignorance of the nature of material existence, which is as complete, according to Mr. Locke's admission, as is our ignorance of the nature of spiritual existence. In every other point of view the sentence is illogical. Mr. Locke assumes that the impressions and ideas, which we are accustomed to consider as qualities inherent in a material substratum, are derived from without. This, however, is really *gratis dictum*, and is a mere assumption. Our impressions and ideas of the qualities of matter, which we are accustomed to consider as



derived externally, may be just as probably impressed upon our minds, whether immediately or mediately by the Deity, under certain conditions. Indeed, the latter supposition is by far the most probable of the two. Our discipline here, whether derived from the ordinary necessities and pursuits of life, or from the higher studies of literature and science, is mental entirely. It is more likely, then, that the impressions and ideas that we receive in this state of existence, should be given to us through the ministration of spiritual agency, than that they should be the product of huge masses of that which we habitually style "brute matter," of which we can only conceive as of a multitude of brute atoms, congregated together, but incapable of feeling or of intelligence. We have Mr. Locke's admission that our conception of material existence only amounts to a set of ideas of certain qualities, which are assumed to be inherent in a material substratum, of which we know absolutely nothing. But this assumption involves an insuperable difficulty. If matter exist, so must space. Now, what is space?—or, how is it to be defined? Our idea of space is merely a negation of matter; but who can define a negation?—or, how are we to conceive of a mere negation as of an existing something, or as of something created? We may conceive the Creator calling a set of qualities, inherent in an unknown substratum, into existence. But we can have no conception of space (our idea of which only amounts to a negation) as a created thing, or as existing, independently, as an external something, which, as it had a beginning, might cease to exist, and be annihilated. Yet this space must be, if we are to

assert matter to be a created existence, which had a beginning. If we forego this assertion, then the idea of space is wholly superfluous, and, indeed, impossible and absurd. Thus, then, we must conclude that the assumption of material existence involves this difficulty, that it cannot be assumed without the assumption of the positive and created existence of a mere negation, equivalent to nothing at all—a condition which cannot even be stated without absurdity.

Such are the difficulties attendant upon the bare assumption of an external, material existence. The various other difficulties involved in that assumption will be stated in the pages which follow.

Bulman Village, near Newcastle-on-Tyne,

June 30th, 1870.

MATTER FOR MATERIALISTS.

LETTER I.

INTRODUCTORY.

IN commencing the apparently desperate enterprise which constitutes the purpose and intent of this and the following letters, I am, of course, entirely and perfectly aware that to all minds, however acute and comprehensive, excepting those only well accustomed to metaphysical reasoning and discussion, the mere enunciation of the principles of Doctor Berkeley as to the nature of existence must appear as a deliberate outrage on common sense, so gross as almost to argue a want of sanity in him who ventures gravely to state them. This risk I am prepared, however, to encounter. A little consideration, on the part of those who may be inclined to treat this question as unworthy of the notice of any reasoning mind, will convince them that there are, and have been, other questions, the true conclusions as to which seem to be equally opposed to the evidence of the senses and to all right reasoning, but which yet, now, command the assent of all mankind.

No very long time has elapsed since Galileo and Copernicus were esteemed absurd visionaries for asserting the motion of the earth, and holding the sun to be the centre round which the planets move. Nor was this surprising. Nothing can be conceived to be more contradictory to the evidence of our senses than the denial of the sun's motion. So contradictory is it that even now philosophers, like other people, feel themselves constrained to talk as if the ancient notions as to the sun's course were the true notions. We all talk of "the sun's rising and setting" as if that luminary really did rise and set, although we are perfectly aware that the contrary is the

truth, and that it is we who move and not the sun. This we know to have been demonstrated past all doubt. Yet so impossible is it to abandon the sensible impression of the sun's motion, that we are compelled to adapt our language to it, as if it were correct.

With regard to the antipodes the same difficulty presents itself. It is now, of course, an admitted truism that the earth is a sphere, a little flattened at the poles, and that, consequently, the persons at the antipodes stand with their feet towards us; the terms "up" and "down" with them having a meaning the reverse of that which we connect with them. This is, of course, not denied by anyone—yet however true the conclusion, we find it impossible to conceive the truth. The imagination refuses the task; and we can only conceive of the inhabitants of New Zealand as walking about with their heads downwards, as flies walk upon the ceiling of a room.

As Galileo underwent persecution for affirming the motion of the earth, so Harvey suffered for affirming the circulation of the blood. So utterly absurd, incredible, and indeed impossible did his theory appear to the eyes of his contemporaries of all ranks, that he became considered, almost universally, as a half insane visionary, one consequence of which was that he lost the greater part of his practice as a physician. Yet no anatomist now has the slightest doubt as to the correctness of the views of this celebrated man, whose grand discovery all but ruined him, whilst it exposed him to imputations the most cruel and unjust. When Sir Isaac Newton boldly predicted that water and the diamond would some day be proved to be two of the most inflammable of substances, his immense and merited reputation alone saved him from imputations similar to those by which Harvey was assailed. Since that time the diamond has been proved to be carbon, in such a state of purity that it may be burned without leaving any residuum; and Cavendish has demonstrated that water is composed of hydrogen and oxygen—one a highly inflammable gas, the other a gas by which combustion alone is supported. In the apprehensions of not only the vulgar but of scientific men, the sagacious and intrepid prediction of Newton was deemed of as those of Mother Shipton, Richard Brothers, or Emmanuel Count Swedenborg. Yet now his wonderful sagacity in uttering it is admitted by

everybody; so little do we know, and so many truths yet remain to be demonstrated, any present anticipation of which would sound, at this day, as little better than the dream of a madman.

As chemists we are led to witness phenomena and are compelled to acquiesce in conclusions equally inexplicable in the present state of knowledge. That which I mean to express is that chemistry forces us to admit, as true, conclusions which no power of imagination can conceive to be possible, and which are incapable of even plausible explanation. Thus, modern chemists allege that the ultimate particles of matter (I use their own expression) arrange themselves in a peculiar manner, to form a compound body which has all the chemical relations of a simple body (so-called), and which are termed "radicles." This is, I suppose, because out of this compound, by a modification of the arrangement, various other compounds may be formed, differing essentially from each other, and the difference being merely the result of a change of arrangement.

For instance, we are assured by professors of chemical science that a compound of platinum, chlorine, nitrogen, and hydrogen, having the formula of $P\ Ch\ NH_4$ acts the part of a simple body, and combines, as such, with oxygen, *chlorine*, &c., &c.; and thus, in the *chloride*, we have the same body (chlorine) performing totally different functions in the same compound.

If we admit the prevailing theory that all these substances are composed of material atoms, having peculiar inherent qualities, this statement is indeed puzzling.*

*The idea of matter is alone sustainable in the mind by assuming the existence of atoms; but this only puts the elephant upon the tortoise. The atom idea is surrounded by the same difficulties as attend the idea of a larger material mass. Priestley, who saw this, at last reduced his definition of matter to "centres of attraction and repulsion." Faraday seems to have repeated the same absurdity of trying to conceive qualities existing abstractedly from anything of which they are the qualities. Thus, Faraday is said to have argued "you imagine a nucleus *a*, and surround it by forces (shape, solidity, colour, motion, &c.) which may be called *m*. To my mind, the *a*, or nucleus, vanishes, and the substance consists in the powers (qualities) of *m*." This is merely the old exploded doctrine of "abstract ideas," under a new nomenclature. What used to be called "attributes," or "qualities," he styles "forces." Scriblerus tried to form an abstract idea of a Lord Mayor, divested of his wig, chain, gown, and gilt coach; that is to say he tried to imagine "the nucleus" of a

One of the ingredients of this compound of four substances is chlorine. The compound must, therefore, contain a certain number of atoms of chlorine, according to the atomic theory. Further, we are to believe that this quadruple compound acts the part of a simple body, and, as simple bodies do, combines chemically with certain other bodies—to wit, with oxygen and (*mirabile dictû*!) with chlorine, so as to become a *chloride*.

Now, what is the English of this? We must either believe that, by mere force of position or arrangement, the atoms of chlorine have changed their nature totally; or we must believe that a chemical absurdity may be true, and that such a body as chloride of chlorine may exist; though it cannot be stated without involving a contradiction, that is to say, that by adding chlorine to chlorine, something not chlorine is produced.

It may be easy to say that this very incomprehensible result is to be attributed to arrangement; but can any mind conceive this, or image the *modus operandi*? If we suppose the arrangement of the atoms in the compound to be *P Ch N H*, how is it possible to conceive that, by merely changing their relative positions into *P N H Ch*, the nature of the last should be made to undergo a total change and become something else?

The atomic theory in chemistry is full of these puzzles and seeming contradictions. They are not comprehensible by any effort of the mind, but are not, therefore, rejected.

I refer to these instances merely to point out that we already


Lord Mayor. Locke, in the same way, tries to conceive an unknown "substratum," in which the attributes of matter, such as shape, colour, solidity, extension, and mobility, inhere. The whole difficulty, in all the cases, resides in the attempt to conceive the existence of anything, out of, and apart from the mind which perceives. When talking of "nucleus," or "substratum," we are talking only of a mental impression, of an indefinite and imperfect sort; and if we try to imagine it as existing apart from the mind that conceives it, as a matter of course, it vanishes; leaving only behind a set of abstract qualities or "forces," inherent in, and belonging to, nothing; and, as such, really inconceivable. To talk of attributes in the abstract; such as beauty, shape, colour, solidity, mobility, extension, or ponderosity, is merely to use words to which no ideas can be attached; in short, words without meaning: for all beauty must be the beauty of something; all extension the extension of something; all motion the motion of something; all force the force of something; and so on.

admit various things to be true which contradict that which is commonly called "the evidence of our senses," as well as others which, taking the experience of the senses as our guide, we cannot by any effort conceive to be possible. From which it seems to follow that, even admitting that in the course of the letters that succeed, I may call upon the reader to believe propositions contrary to the testimony of our senses (so-called), I should in such case be doing nothing new. I may as well state, however, in this place, that I do not admit it to be my intention to do any such thing. I shall, on the contrary, admit the evidence of the senses as far as it can be legitimately and logically allowed to go, however strongly I may object to certain inferences which men are accustomed to append to that evidence, as if they necessarily flowed from it; which I assert to be an error in logic.

This is all that seems to be requisite to be said as to this point, in the shape of preface or introduction. I must not, however, leave the subject without adverting to an expression employed by Doctor Berkeley, in his celebrated treatise "On the Principles of Human Knowledge," which appears to me to be ill-judged and erroneous, and the tendency of which is to create in the mind a prejudice against the theory, so admirably laid down by him, which might have been, and should have been, avoided.

The expression, to which I allude, occurs in paragraph xxxv., Part I. of the tract "On the Principles of Human Knowledge," and it is in the following words:—"The only thing whose existence we deny is that which philosophers call matter or corporeal substance. And in doing this there is no damage done to the rest of mankind, who, I dare say, will never miss it."

This passage has, I believe, been already made the subject of objection, and by one well qualified to give an opinion on the matter, that is to say by Mr. Lewes, the author of "The Biographical History of Philosophy." Be that as it may, I must be allowed also to enter my protest against it. To me it seems to be undeniable that, at all events, it has been the intention of the Creator that all men, philosophers included, should act and talk as if their impressions and



perceptions were caused by material substances, existing without the mind. It is certain that philosophers, including the Bishop of Cloyne himself, ever did, and ever do, so talk and act. It is also equally certain that mankind, in the mass, hold the perceived qualities of things to be direct proofs of the separate and independent existence of the things in the abstract. In short, all men, excepting metaphysicians, hold that perceiving the qualities of objects is identical with the perception of the objects. They do not separate "quality" and "object;" and it is, in general, exceedingly difficult to make ordinary persons see that our perceptions of shape, colour, solidity, and distance are no proofs of the existence, without the mind, of some material object in which the qualities are inherent; inasmuch as these perceptions may be caused by the direct act of the Creator, without the intervention or employment of material objects at all. The expression quoted, therefore, by which the Bishop seems to wish to make it appear that the vulgar really thought as he did, is very objectionable. Everyone, who has tried the experiment, must know that it is almost impossible to make one totally undisciplined in metaphysical reasoning understand the propositions in which the Berkeleyan theory is enunciated, and, if understood, they are by men in general held to be little better than insanity, or ingeniously elaborated nonsense. This is certainly my own experience; and being so, I write under a fixed impression that ordinary readers must and will, on a first view, hold that which I say to be so remote from common sense as hardly to be worthy of a serious consideration. In fact, the sole reason of Berkeley's principle having made so little way, even in the philosophical world, is this—that it so directly contradicts all our practical conclusions, as well as all our practice, that we recoil from it, as plainly absurd and untenable; nor can we bring ourselves to entertain it even for a moment as true, until after deep thought and patient reflection.

Having cleared the ground thus far, I may be allowed to state, in brief, the mode of argument which I intend to pursue. It is shortly this. It is not my purpose, nor is it in my power, to give direct proof of the truth of the Berkeleyan theory. It seems to me that

its truth cannot be demonstrated directly. I shall, however, show, I think, beyond all doubt or denial, that the opposite, or material, theory necessarily involves so many plain contradictions and manifest absurdities, that we are placed in this dilemma—we must, perforce, try to erect some other theory, not material; or we must admit that a theory which involves palpable contradictions may yet, nevertheless, be true—an admission which strikes at the foundation of all reasoning, and at the admission of any conclusion based upon reasoning; which, in short, would establish a universal scepticism.

If this position can be proved, as, in my humble opinion, it may be, quite unanswerably, then comes the enquiry, what other theory (not material) are we to adopt? This, at once, naturally conducts us to an examination of the little-understood treatise of Bishop Berkeley, “On the Principles of Human Knowledge,” as well as of his other treatises which bear upon the same subject, and more especially of “The Analyst,” in which he demonstrates the absurdities and contradictions involved in the doctrine and method of “fluxions,” as originally invented and taught by Sir Isaac Newton and Lëibnitz, and adopted by mathematicians universally.

I presume that no apology needs to be made for the adoption of this mode of argument. The *reductio ad absurdum* is a method used as freely by mathematicians as by any other class of reasoners; nor can I see the slightest ground for supposing it less valid or less convincing than other forms of ratiocination. That proposition, which involves, in its admission, one or more contradictions, cannot possibly be true. If it could, then would it be out of the power of reasoning to prove any proposition, however monstrous and extravagant, to be untrue; inasmuch as the surest mode of proving the falsehood of any assumption is to show that its admission necessitates, at the same time, the admission of a contradiction in terms, or a palpable impossibility.

One rule I have laid down for myself, and determined to follow, in the composition of the succeeding letters. I shall avoid as much as possible the use of all technical words, and eschew, at all hazards, the introduction of a strange or pedantic phraseology. Few things

have tended more to render metaphysical reasoning more obscure than it needs to be than the introduction of a strange vocabulary. Neither additional clearness, nor additional precision, was ever gained by the intrusion of words coined for a purpose. In order to understand them at all, an ordinary reader requires a definition; and that definition he is driven to recall to his mind whenever the term occurs. The intricacy of abstruse reasoning may be augmented by this, but cannot be diminished. The employment of words and expressions, familiar to all educated persons, is really the shortest and easiest road to the end in view; and I have ever found it prove so, be the subject what it might. When I assert this, I, of course, speak generally, and only intend to lay down a general rule of conduct. In the course of a long metaphysical disquisition it is hardly possible to avoid entirely the introduction of expressions or terms which are peculiar to the subject in hand. All then that can be done is to take care to define the full meaning of the word or expression used, and to avoid any deviation, however slight, from that meaning. With these prefatory remarks, which appear to me to include all that is necessary, I conclude this letter.

LETTER II.

BEING.

IN commencing this enquiry, I assume that it must be admitted, and without much hesitation, that no man ever was able, or pretended even to be able, to conceive of more than two kinds of existence, which we are accustomed to designate as "material and "spiritual." In treating of these two, I use the words "existence" and "substance" as conveying the same meaning. They stand for "being" in the abstract; and spiritual or material existences or substances are material and spiritual beings.

Matter or material being I define as materialists define it. I define it as a substance incapable of sensation of any kind, known to us only through certain qualities, seemingly inherent in it, or in some way attached to it or connected with it, such as solidity, gravitation, visibility, shape, colour, capability of motion, and divisibility.

Spiritual substance or being I define as a substance having no quality in common with material substance, but entirely distinct from it. It is, in short, an immaterial substance or being, having no relations, of any kind, to or with material being, and to which we can only attribute three, or at most four, qualities, that is to say, identity, or, in other words, positive oneness; the capability of receiving simple sensations or compound sensations; memory; and the capability of reflection or thinking; by which last I mean the power of recalling sensations which have been received, of recombining them, and drawing conclusions from them through the ratiocinative process.

Immaterial beings may, as it seems to me, be properly divided into two classes. First come immaterial beings, capable of receiving and retaining one, two, three, or more simple sensations. Secondly

comes a higher class of immaterial beings, capable not only of receiving, and retaining or remembering, simple sensations, but capable, also, of recalling, recombining, and reflecting upon them. The first class is the *ens sentiens*, or sentient being, capable of receiving and retaining sensations. The second class is the *ens cogitans*, or thinking being, capable of recalling, recombining, and reasoning upon sensations already received; the exercise of this faculty, being sometimes the imaginative faculty, and sometimes the reasoning faculty, according to the nature of the recombination of sensations already received and retained, which, when recalled, may be not improperly named "ideas," in contradistinction to sensations, as first received.


To these definitions of material and immaterial being I would add this further remark—that the two kinds of being are separated from each other by one remarkable line of distinction, or demarcation, which ought never to be lost sight of. This line of demarcation, which is of the first importance in an enquiry of this kind, is as follows.

Before we can conceive the existence of any distinct material substance whatever, visible or tangible in its nature or both, we must, first, have acquired in some way, one great primary idea, which, when once acquired, the mind cannot for a moment exclude or shut out again, and that is the idea of pure extension or space, in the abstract. This idea, imperfect as it is or must be, is absolutely necessary to our apprehension of all other perceptions and ideas which we acquire through our senses. This is self-evident. All objects having shape, tangibility, colour, smell, or motion, must exist in space. The idea of space, therefore, is requisite for our perception of the whole of them. So also is the abstract idea of time, which will be found to be only a modification of the general idea of space. All existences, perceived by us, must exist in and during some time. The succession of existences is perceived through the medium of the same general idea. Our only idea of succession is that of a series of steps, which can only be indicated to the mind, as portions of space are, by being, in some sort, separated and distinguished from each other.

The principal point to be noted as to these two ideas, beyond their being necessary to our perception of all the rest, is their utter and

hopeless imperfection. Men confidently affirm the existence of space. Men confidently assert the existence of time. A denial of either would, to the great majority of mankind, appear as mere wilful paradox or insanity. Yet no man could ever attain to a perfect idea of space or time, in their extended sense. We can easily acquire the idea of smaller and larger spaces, and of shorter and longer times; but there we stop. If we strive to go beyond this, we only get the idea of a very large space, or very long time, but which are yet limited, and to which more space and more time may be added *ad infinitum*, and the complete idea be as far off as ever, and as unapproachable. Thus, then, our ideas of space and time are mere imperfect ideas. We may attempt to define them in words; but we shall find the words lose their meaning, and become sounds with no sensible idea annexed to them. *Vox et preterea nihil.*

This being admitted, as I think it must be, we are led insensibly to another step of this enquiry. If these primary ideas be (as they are admitted to be) quite imperfect, do they represent real existences at all, in the ordinary sense and acceptance of the terms "real existence?" That is to say do they represent any thing out of the mind that acquires them, or is impressed with them? Or may not these ideas be given us as instruments merely, or means, in virtue of which we are enabled to receive and apprehend the host of minor ideas which make up the sum of human intelligence? This is not the place for discussing this question. It would be premature now to do so. It is proper, however, to note that there is room for such a question; and if after the subjects of space and time shall have been discussed and investigated, it shall appear that the assumption that their existence, apart from the mind that perceives them, involves a host of contradictions and difficulties, then it may be necessary to conclude that to deny them any existence apart from a perceiving mind may be easier to be admitted than is the first supposition of their distinct and independent being. This matter we shall examine at the proper time. In the meanwhile, the peculiar imperfection involved in our ideas both of space and time has been noted, together with the question which may possibly arise out of that admitted peculiarity.



There are, however, other points as to which gratuitous assumptions have been indulged in by metaphysicians, without either notice of, or allusion to, the very palpable contradictions involved in them. These assumptions have been ventured without reference to a rule, which seems to me absolutely necessary to be observed in all metaphysical reasoning. This rule is that, for substances or beings of any kind, material or immaterial, to act upon and re-act upon each other, they must possess one or more qualities in common. To admit of impulse or pressure of one body acting upon another, both must have solidity, or in other words the power of repulsion. If motion is to be communicated from one body to another, by one impinging upon the other, there must be inherent, in both, not only solidity but the capability of being moved. If heat is to be transferred, there must be the capability of receiving and giving out caloric, both in the body that transmits and the body that receives the heat.

This rule equally applies to immaterial being or spiritual existence. If ideas are to be communicated, both must have the faculty of receiving and giving ideas. If the ideas communicated be complex, the faculty of reflection and that of memory must reside in both minds, and the truth of this rule is self-evident, inasmuch as it is impossible to conceive either material impulse or pressure, or the intercommunication of ideas between two cogitant substances, without, at the same time, conceiving the possession, in every case, of qualities in common.

It has been asked, and may again be asked, how we prove the existence of immaterial being at all; inasmuch as the senses afford us no evidence of the presence of any spiritual being? My answer to this is twofold. I reply, first, that the interrogator, in this case, assumes that the senses afford undeniable evidence of the presence of material substance, which, it will be seen, is not true. And I reply, secondly, that proof by evidence is not needed, inasmuch as every man is directly conscious of the immateriality of his own mind, and feels that in the spirituality of his mental being consists his identity. In thus expressing myself, I do not mean to say that all men reflect and reason upon these things. In fact, very few persons, indeed, can be induced to do so. But all who do so arrive at one conclusion as a

matter of necessity; because they find that to make the very first logical step they must assume that which they are attempting to prove. Hence the manifest inutility, or rather futility, of the well-known axiom of Descartes :—"I think, therefore I am." Put as a formal syllogism it would stand thus :—"Thought must be the quality of some being; I think, therefore I am." This, however, is plainly bad logic; as the point to be demonstrated is assumed in the minor proposition "I think;" nor can any syllogism, as to this particular conclusion, be constructed which does not involve the same imperfection. We cannot circuitously prove that which we know directly. To use that phraseology by which Kant has so completely taken possession of the minds of his countrymen—the knowledge of the spirituality of our own mental being is "objective." It is our sole "noumenon," for, in opposition to Kant, I must maintain that all the rest of our knowledge is phenomenal, and obtained by impressions made upon us through the medium of the senses. In fact, the objection that is fatal to Kant's assertion of the existence of "noumena," these "noumena" being certain things which the mind of man perceives "objectively," or by its own energy; the objection, fatal to this assertion, is to be found, I think, in this that, did the mind possess such a gift, it would be common to, and admitted by, all men, without exception. This, however, is certainly not so. According to Kant, we know that "our wills are free" objectively. That is to say, we do not know it by evidence, or influence, or any method of mental analysis, but directly. Now, I assert in opposition to Kant, that I am without such knowledge; and that, further, I have no belief in the freedom of the will, as a metaphysical doctrine. Nay, I must go even beyond this, and affirm that I have never seen nor heard any intelligible definition of the terms "freedom of the will," that is to say, any definition given by the friends of the doctrine. Definitions have certainly been attempted, but by those who disbelieve the doctrine. For instance, it has been asked do you mean that the will has an inherent active control over itself; and that a man who on Monday ardently loves one woman, and bitterly hates another, can, by any act of his, change his will on Tuesday, and love the woman whom he

hated, and hate the woman whom he loved, the day before? This no advocate of the doctrine of "free will" dares to answer in the affirmative. Yet, if "freedom of will" does not mean this, what does it mean? No one denies that men are free to will that which they do will; but the question remains, by what is that will determined? By the man himself, or by something external to the man, and independent of him? As far as regards "freedom of will" (so-called) no one has shown that the man determines his own will. On the other hand, however, there is ample evidence that men's wills are shaped, directed, and determined by impressions from without, received through the passions and the understanding secondarily, and through the senses primarily; these impressions being independent of any control by the mind of the man which receives them, though often, indeed generally, conflicting; the ultimate result upon the will being determined by the greater power of the motives, which incline the mind to, or dissuade it from, a certain course of action.

These observations may appear digressive, but I trust they are not so. They were necessary to impress upon the enquirer the importance of the truth that there is, to the human mind, only one "noumenon," which is the knowledge of its own spirituality; and the utter inanity of the notion that thought, or mental perception of any kind, can reside in, or be the product of, any combination of atoms of matter—or any material substance of any sort, assuming such to exist, and assuming it possible and conceivable that material substances should exist in any other mode than combined atoms.

Another proof of the immateriality of that which perceives, remembers, and reflects, resides in the impossibility of attributing identity to anything but a sole essence, of which the powers of perceiving, remembering, and reflecting, are attributes or qualities. No man, whether sane or insane, ever doubted of his own identity. It is quite true that insane persons have often insane ideas as to their own personality. A madman believes himself to be Julius Cæsar, or Alexander the Great, but this involves no mistake as to his own identity. His insanity resides in the mistaken persuasion that the world is in error as to his antecedents and his relations to other men.

He insists upon it that he is Julius Caesar or Alexander. The world will have him to be John Doe, the costermonger. There is still, however, no question, on either side, as to the identity of the man. The dispute hinges upon the collateral circumstances. In short, it is not in the power of even a madman to believe to-day, that he is not the same man that he was yesterday. This is because the identity of a human being resides in the individuality and essential unity of that being. He is that which he is entirely from his own positive oneness, independently of all collateral circumstances. And this a short consideration will manifest, when we come to inquire particularly what identity is and in what it consists. In the meantime, it is sufficient to indicate that it cannot be the product of material arrangement, or of arrangement of any conceivable description; and, hence, in the question of identity the question of immateriality is involved. One merges in the other. Our conviction that our mind is immaterial and spiritual, and our conviction that we are, to-day, the same essence that we were yesterday, are intuitive, and for the same reason; that is to say, because we know both directly and independently of all reasoning and all evidence of every kind. And our knowledge of our own identity is the same as our knowledge of our own spirituality; mind in each case, being the thing that is identical and the thing that is immaterial.

Such are the general remarks or conclusions which seem to be requisite, as a preface to the more minute and detailed enquiry, upon which we are about to enter. In pursuing that enquiry, I shall take the material system first; beginning with the primary ideas of space and time, which are necessary, in the first place, to be acquired before we can form the various ideas involved in the supposition of material existence. Having done this, I shall investigate the various qualities held to be inherent in matter, or else secondarily connected with it. These may be placed under two distinct heads. First, there are the qualities of matter as it is supposed to form the material universe. Second, there are certain qualities attributed to it as forming the human or animal body.

Under the first head come, in some order or other, cohesion of

atoms, solidity, attraction and repulsion, magnitude, capability of motion, divisibility, colour, shape, and temperature.

Under the second head may be classed the power of conveying impressions to the mind, the senses of sight, touch, hearing, taste, and smell, muscular power, and the formation of bodily habits and the theory of germs.

Having examined these portions of the subject, and stated, as fairly and clearly as it is in my power to do, the many difficulties in which we shall find ourselves involved, I shall take up the other branch—Immaterial Being.

Immaterial being may be divided into two classes—sentient beings and cogitant beings.

Sentient beings may embrace many species; setting out with such as are capable of receiving and surveying only one description of sensation, and then ascending through innumerable modifications to others, capable of receiving and conveying various complex sensations; having also the faculty of memory, and unlimited power of reflection.

Cogitant being may include those, not only capable of receiving any series of complex sensations, but endowed, also, with memory and reflection, and, lastly, with the power of mental progress, and the faculty of teaching and being taught, which is included in it.

I shall then show the consequences that have followed the assumption of the existence of both of these descriptions of being—material and immaterial—and of the attempt to mix them, as it were, together into a kind of composite being; and at the same time, endeavour to remove the common notion of some supposed necessity for this *vain* attempt, notwithstanding the many contradictions thereby involved.

LETTER III.

SPACE.

OUR impression of space must necessarily be acquired, either before or at the same time, with our first and earliest impressions of visible or tangible things. This is plain enough : because all visible and tangible objects, if existing independently of the mind, must exist in space, and the space and the thing contained must be apprehended by the mind at one and the same time. Supposing both to be mental impressions merely, the same rule holds. Because the impression of shape must exist in virtue of, and within, an impression of space : the space being the outside of the limitary lines by means of which shape is designated, or indicated, as a visible impression.

Thus the infant must obtain the impression of space when he obtains either a tangible or visible impression of his mother's or nurse's breast : space being that which is outside of the visible, or tangible, idea of the fountain whence his sustenance is derived. This is the infant's first idea of space, obtained when he obtains his first visible or tangible idea of something distinct from space. But in this, it will afterwards be seen, the impression of distance is not included. This he obtains with the idea of motion ; neither being, absolutely and in strictness, requisite to the reception and apprehension of impressions of visible or tangible things. That is to say, the impression of a visible or tangible thing may be conceived by the mind, independently of any idea of distance or motion ; as any one may ascertain by trying. The same sort of experience will, however, prove the reverse to be true of our idea of space, which is inseparably connected with all our ideas of visible and tangible existences ; and when once acquired can never again be banished from the mind. The reason of this is palpable and obvious. We can dismiss from our minds the idea of all

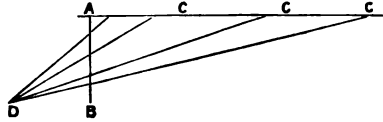
distinct existences, tangible and visible, but not the impression of our own bodies and limbs, which must always be present. But the impression of our own body, as an existence, requires that of space. Hence we cannot dismiss that of space, which that of our own bodily existence requires to be present.

Such is the process through which our idea of space is acquired. The earliest impression is very limited. As the mind advances, it becomes more and more enlarged: but a careful examination must convince every enquirer that no perfect or complete idea of space can possibly be formed. That as an idea it is, and ever must be, imperfect and totally unsatisfactory; being, in truth, more properly definable as a perpetual attempt by the mind to obtain an idea, in which it partially succeeds, but can never entirely achieve.

This experience easily confirms. When the mind makes the attempt to embrace the idea of absolute, abstract, space, it is found that the utmost obtainable is an idea of some very vast but still limited space. A second effort enables us to enlarge that space; and so we may go on enlarging and again enlarging until wearied; but, at the end we are really as far off a complete idea as we were at first. Nor is this all. A careful investigation will convince us that it is not only impossible for the human mind to apprehend space in the abstract, but that it is equally impossible for us to conceive that it could be apprehended by any mind whatsoever, even by the Deity himself. For, admitting that the intellect of the Divine Being is infinitely great, the idea of abstract space must be also infinite; and even an infinity cannot include another infinity, for inclusion involves limits, and the infinite denies limitation. Thus, therefore, the idea of space, in the abstract, seems to be a metaphysical impossibility in every point of view. And this brings us to the other branch of the enquiry—can there be such a thing as space, as a real existence, apart from any mind, and having an independent being?

If space really exist, otherwise than as a primary idea, it must be infinite: for space, in the abstract, sets limitation at defiance. But infinite space may be subdivided into limited spaces, and this subdivision must also be without limit, be the subdivisions of what

extension they may: and as these limited spaces, or extensions, are demonstrably capable of being again subdivided into an infinite number of parts, it follows that abstract space must contain an infinitude of infinitudes; and as these, again, might be subjected to the same process, we arrive at an infinitude of infinitudes of infinitudes, which, if not words without meaning, afford no idea that the mind can comprehend—and are merely algebraic signs standing for unknown quantities. That limited spaces are infinitely divisible is very easily demonstrated. Thus, if we draw a vertical line of an inch in height, it is easily shown that an infinitude of lines may be made to pass through, and divide it into as many parts as there are lines, for instance:—



Here A B is a vertical line of one inch in perpendicular height. From the top of this vertical line the horizontal line A C C C may be drawn at right angles, and continued infinitely in the same direction. If we assume a point D, to the left of the vertical line A B, and on a level with B, it is evident that an infinite number of lines may be drawn from B to the horizontal line A C C C, and that they must all pass through, cut, and subdivide the vertical inch A B, and this without end or limit.

If we suppose an infinite continuation of such lines, the result is that the vertical line A B becomes the secant of an infinite number of lines, drawn from the point D to the endless horizontal line A C C C, &c., all of which help to form a series, which can never be completed, of angles, continually becoming more and more acute.

If, therefore, we were to draw a second horizontal line from B, parallel to the first horizontal line, A C C C, the result would be that the oblique lines drawn from D to the the first horizontal line, A C C, would draw continually nearer and nearer to a parallel with the second horizontal line, B C C C, &c., but without the possibility of ever touching it.

Nor does it help to solve the difficulty, nor reconcile the paradox, to say, as some have said, that, at length, the sections would be so minute as not to amount to any assignable quantity of space. For although it may be true that to assign any quantity to a section so minute might not be in our power, yet it might be in the power of some other being to do so, very easily. When we come to treat of "magnitude" as a property of extension, or space, or matter, we shall find that, as to magnitude, in the abstract, we cannot conclude anything. As to the relation which a lesser magnitude bears to a greater we can come to a conclusion beyond doubt. For instance, we certainly know the relation of a square foot to a square yard, or of a square rood to a square acre. But the magnitude, in the abstract, of that which we call a square yard, we know nothing, nor can we ascertain anything. We cannot be sure that we see any one object twice of the same precise magnitude. Magnitude depends upon the optical conditions of the eye which sees. We know the relative sizes, according to our own eyes, of a flea, a bat, and an elephant. To another eye a flea may be as large as a bat is to us. To another a flea may be as large as an elephant is to us; or to another a bat may be as small as a flea is to us; and to another an elephant may be as small as a flea is to us. It is, therefore, in vain to talk of spaces or things being "too small" to have assignable quantities; inasmuch as magnitude, in the abstract, has no existence, and is, therefore, unknowable and incapable of affording a basis for any conclusion in reason.

The infinite divisibility of space or extension, which means only its being subject to an infinity of littleness as well as an infinity of bigness, is only one of the difficulties into which the admission of its real existence conducts us and there leaves us. If we turn to the subject of "place or locality," considered in the abstract, we shall encounter embarrassments similar in character.

The definition of "place or locality," given by metaphysicians, is that it is a part of space, which either is, or else may be, occupied by some material being or substance.

This, in the abstract, may be an intelligible definition. If, how-

ever, we investigate the subject more minutely and rigorously, we shall find it full of difficulty. Let any one imagine that there is nothing but a boundless immensity of space, and then assume that a particular spot of that space is marked by the letter A. If he be asked to prove that this mark, A, still is where it was first placed, and has not moved, and is not at that moment changing place, what evidence is there that it has not moved or is not now moving? It has no relation to anything else by which change can be proved; and all that we know of motion is, that the thing moved changes its place in relation to some other thing or things.

If, for instance, we assume two portions of space, marked respectively A and B, at a distance from each other of a mile, we may, by showing that the distance has become greater or less than a mile, prove that one of them has moved nearer to or further from the other; or that the motion has been mutual; but this relative motion is all that can be proved. We cannot prove that the two may not be constantly moving, their distance from each other being preserved: just as we cannot prove that the whole of the visible universe may not be moving (as some suppose it is) through space, the relative distances of the fixed stars and planets being preserved.

It is, I must, however, add, strongly to be suspected that, when we talk of universal space, as many do, as an existing something, we are deceiving ourselves by using words destitute of meaning. It has been already shown that the reason of our inability to exclude the idea of space from the mind, after it has once been perceived, is because we cannot exclude the idea of our own corporeal existence to which the idea of space is necessary. If we exist in the body we must exist in space, and the perception of space is requisite to our perceptions of our own bodily being. The argument, however, does not end here.

It is quite possible, by a strong effort of mind, to conceive the whole material universe, ourselves included, to be annihilated and made to vanish. In that case, what would remain? A universal nothing, destitute of qualities of any kind. To say that space would still remain, is a gratuitous assertion. Why should space remain,

when no existence remained for which space was necessary? Or by what words can a materialist define nothing, save by the negation and absence of all material existences? To say, as some have said, that, even if matter had never been created, space must still have existed, is to erect space into something self-existent and independent of the Deity, which, to say the best of it, is absurd. It seems sufficiently clear and palpable to me that this notion of the necessary existence of space has arisen altogether from the impossibility of excluding the idea of it from the mind where it is irrevocably associated with our bodily perceptions. Exclude the idea of all being—your own amongst the rest—and nothing is left. To call that nothing “space,” and to treat it as something independently existing, seems to me mere logomachy. The conclusion to which I feel myself to be driven, therefore, is, finally, this:—To conceive space existing in the abstract, or as anything real, apart from ourselves, conducts us, at once, to a series of absurdities and contradictions. I conclude it, then, to be an imperfect idea merely, given us as an instrument, and necessary to our reception of other impressions and ideas, but existing only in our own minds.

When we come to treat of time, we shall be driven to a similar conclusion. We shall find our idea of time to be a mere modification of our idea of space, given us for a similar use. If we attempt to treat it in the abstract as something existing out of the mind, we shall be inevitably plunged into a maze of difficulties and contradictions analogous to those which are involved in the abstract notion of space, and we shall at length be compelled to take refuge in the conclusion that our idea of time is an imperfect idea like that of space, but requisite to enable us to understand the successions, in the order of nature, of our own impressions of events, and of the series of ideas, stored up in the memory, and constituting our lives, together with that continuity of consciousness in which identity or “the Ego” mainly resides, and through which we recognise it.

LETTER IV.

TIME.

IF we closely examine our conception of time, we shall find our idea of it, like that of space, to be altogether imperfect. We shall, likewise, discover it to be, as it were, a modification of our idea of extension or space. For to what, after all, does our conception of time amount? We conceive of it as a sort of line, the beginning of which is hidden in clouds, which comes from a distance, towards and to us, and may, in imagination, be extended beyond us *ad infinitum*. Thus our idea of time is very analogous to our idea of extension, and has much in common with it. It is divided by us, mentally, into parts, having certain relations towards and with each other. Thus, we cut it into seconds, minutes, hours, days, weeks, years, and centuries; and these ideal divisions are the means by which we apprehend the march and succession of events, historical or otherwise, from the earliest recorded era down to the present moment. In short, time is the instrument by which we attain the idea of succession, and of that order of nature according to which our impressions have, as to their being felt, a certain relation towards each other. So far metaphysicians are pretty well agreed. But then comes the question—Has time an existence apart from the mind? Is it, as materialists assert, of space, a distinct and real existence? Or does it exist only in the mind?

If we attempt to form an idea of time in the abstract, that is to say a general idea of time, we shall be confronted by a difficulty just as insuperable as that which presented itself when an attempt was made to form an idea of abstract space. All that can be done is to frame an idea of a long line of successive events, which may be extended into the future without end, and to which no beginning can possibly be assigned. Go back as far as you will, there must have

been time before that. Hence, then, the notion of time, common to all men, is merely a modified extension, which may be subdivided, indefinitely and to any extent, into minutes, hours, days, months, years, and centuries. But this is an imperfect idea; and if we assume that time has a real existence, out of the mind, corresponding with that idea, we are beset with difficulties as when we assumed the real existence of abstract space. This a careful consideration will demonstrate.

When we attempted to form the idea of place, abstractedly and not relatively to some other place, we could not do so. We shall find it equally impossible to get the idea of a fixed time in the abstract. It is common, for instance, to hear unthinking persons say "the world was created at such or such a time." Yet, if we try to fix a date for it, having an eternity of time on both sides with which to deal, we shall find it impossible to fix one isolated date. Moreover, if we could, we are immediately involved in insuperable difficulty—inasmuch as this date with an eternity to pass before it, could never have arrived, and hence the world could never have been created. Nor will it answer the purpose, in the least, to reply "the time has arrived, and now the world is created," because the contradiction, at once, must be admitted that an eternity has been passed, which is impossible; the definition of eternity being a something that can never pass. Thus we are, at once, driven to admit, as the only refuge left, that the "nunc," or "now," exists only in our own mind—for did it exist otherwise it never could have arrived.

And this reasoning naturally leads us to another portion of the subject, that of relative time. We have seen that, as with space, so is it with time, there cannot be such a thing even in idea as abstract time. But we have seen, also, that our ideas of relative places are correct and true. So, also, shall we find that our ideas of relative times are correct and true. Thus we know precisely the relation which the year 1700 has to the year 1800, and the relation which 1800 has to the present year. The relative knowledge of time is, in fact, as precise as the relative knowledge of place. We can fix the distance between place and place, and the distance between this time and that

time ; there, however, we stop. We cannot possibly say where any of these dates stand in time in the abstract, because there is no possible point from which to calculate. And hence, we must necessarily acquiesce in the conclusion that, as to time and place, our knowledge is altogether relative and limited ; and that it is impossible for us to assign an abstract existence either to time or space.

Assuming for a moment, that time, as an independent existence, really is to be acknowledged, we plunge into every sort of difficulty. If time, like space, is to be held to exist out of the mind, and independently of any intellect of which it forms one of the ideas, then time also must be infinitely divisible. This is very easily made manifest. When we conceive of time we must conceive of it as a fluxion ; that is to say, as a line starting at a point, and flowing onwards. Let this be done ; and let the line A B in the diagram at page 21, of the last letter, be supposed to start at the point A and to flow downwards to B, with a uniform velocity. It follows that, be the number of divisions, into which the line A B is divided, what they will, the velocities of the fluxion must correspond with the divisions, and for each division there must be a proportionate velocity. But it has been already proved that the line A B is capable of being infinitely divided. In that case, making the line A B a fluxion, starting at the point A and flowing down to B, it will follow that the fluxion A B must be subdivided into an infinite number of velocities, and thus, that which is finite be proved to contain an infinite number of parts, which is a contradiction.

From this contradiction we can only escape by admitting that the time-fluxion, expressed by A B, exists only in idea, and in the mind, and has no real existence independent of it.

Nor is this conclusion in the least impugned by the admitted truth that, when once the mind has apprehended the idea of time, it can never afterwards be excluded, by any effort, even for a moment. This is, no doubt, perfectly true ; as it is likewise true of the idea of space. Both are capable of being explained in one way. The idea of time is necessary to us to enable us to perceive the order of nature, in which our perceptions follow each other. As, therefore, we are never

without perceptions whilst capable of perceiving, the idea of time must always be present along with those perceptions, that we may distinguish the order in which they occur.

Thus, then, as we must always act as if space were a real independently existing thing, so must we always act as if time were a real separately existing thing, as these two ideas are necessary to our reception of all the rest of our sensations, whether visible or tangible of sight or touch, and must ever be present to our minds. Our idea of time has also another extraordinary peculiarity, which it has in common with space, or with magnitude as measured by space. That peculiarity is that we have no idea at all, nor can have any, of the abstract velocity of time. Its relative velocity we can measure exactly—that is to say, we know, exactly, the length of a minute relatively to the length of an hour; or the length of a month as compared with that of a year. But these are relations merely. If we take the minute singly, and the hour singly, we have no certainty that any two persons have the same perception of either. Nor can we be sure that our own perception of the minute or hour, singly, is at all times alike. All we know is that the relation of the minute to the hour, and of the month to the year, is always the same to us, and to others. In point of fact, if we rigidly investigate the matter, and recur back to experience, we shall find that there is a remarkable uncertainty about our ideas of the abstract velocity of time. An hour sometimes passes like a few minutes. A minute sometimes seems an hour.* Who can decide whether this apparent difference be real or

* Some curious evidence as to the occasional celerity of thought, and the number of ideas crowded into a few minutes, may be collected. I have seen a statement by a naval officer, who was taken out of the water insensible but restored to animation, to the effect that, during the few minutes that elapsed before recollection ceased, his whole life seemed to pass in review before him, without the omission of any incident of importance. Without taking this account as literally true, or true in the extreme sense, it is certainly a very extraordinary one. Every fact relative to the question goes to show that time exists only in the mind, and is perpetually modified by changes in our mental conditions. It is impossible to conceive time (as we conceive space) to exist out of the mind of some being or beings. It is only a general idea of succession; and, except in idea, cannot be conceived to exist at all. It is, in short, only the general idea of the order of succession in which particular ideas have been mentally perceived.

not? We attempt to decide by mechanical means. We construct a time-piece by means of springs, or pendulums, and wheels, or we construct an hour-glass, and rectify our apparent differences of perception of time by our perceptions of sight, as given by the clock or the hour-glass. A calm reflection will, however, convince us that this supposed rectification is merely an arbitrary and dogmatical assumption. We have not the slightest evidence that the clock or the hour-glass has measured the time correctly when opposed to our own perceptions. We may as justly assume that they ought to have agreed with our perceptions as to the duration of time. In such case all that can be said is that our visible and mental perceptions are at variance. There is no proof that the visible are more correct than the mental sensations.

Thus, upon the entire view of the case, we find ourselves driven to a conclusion as to the nature of time, the same as that which we felt obliged to admit on the subject of abstract space. We cannot form an idea of time in the abstract. All we arrive at, after every attempt, is the idea of a very long time, which may be indefinitely added to at both ends. This, however, like our idea of abstract space, is a merely imperfect idea. By the human mind abstract time, it is clear, cannot be conceived, nor can we comprehend how an infinite series can possibly be conceived, as a whole, by any mind: for although the infinite may comprehend all that is finite, how can the infinite be contained even by an infinite intellect?

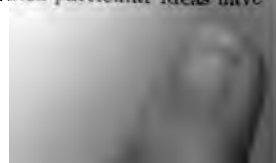
The final conclusion then, of necessity, seems to be that our idea of time is merely a mental instrument, given us to enable us to perceive the natural order in which our impressions follow each other. It is attained in infancy, as is the idea of space, which is an instrument of the same description, attained in infancy, to enable us to apprehend visible and tangible impressions; once attained, these ideas cannot possibly be ever shut out of the mind, even for an instant, as they must accompany all our other impressions and ideas of every kind, without exception.

Before concluding this division of the subject one remark remains to be made. If we assume the independent existence of space and of

without perceptions which capable of perceiving, the idea of time must always be present along with those perceptions, that we may distinguish the order in which they occur.

Thus then as we must always act as if space were a real independently existing thing, so must we always act as if time were a real separately existing thing, as these two ideas are necessary to our reception of all the rest of our sensations, whether visible or tangible of sight or touch, and must ever be present to our minds. Our idea of time has also another extraordinary peculiarity, which it has in common with space, or with magnitude as measured by space. That peculiarity is that we have no idea at all, nor can have any, of the abstract velocity of time. Its relative velocity we can measure exactly—that is to say, we know, exactly, the length of a minute relatively to the length of an hour: or the length of a month as compared with that of a year. But these are relations merely. If we take the minute singly, and the hour singly, we have no certainty that any two persons have the same perception of either. Nor can we be sure that our own perception of the minute or hour, singly, is at all times alike. All we know is that the relation of the minute to the hour, and of the month to the year, is always the same to us, and to others. In point of fact, if we rigidly investigate the matter, and recur back to experience, we shall find that there is a remarkable uncertainty about our ideas of the abstract velocity of time. An hour sometimes passes like a few minutes. A minute sometimes seems an hour.* Who can decide whether this apparent difference be real or

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time, we must further assume the independent existence, out of the mind, of motion. This we cannot possibly avoid. To realize any idea of time, we must realize some idea of motion. This we must do, because we can only conceive of time as a fluxion, or a line made up of flowing points. But, in order to do that, the idea of space must also be present. It must be so because it is utterly impossible for motion, or velocity, to be present to the mind, or conceived by the mind, unless the idea of space be also present. This truth Dr. Berkeley has, in his Treatise "*De Motu*," demonstrated as completely as any truth ever was demonstrated: and I have no hesitation in saying that the man who pretends to be able to conceive the existence of motion, or velocity, without space for the thing moved to move in, pretends to conceive that which no human being ever did or ever will conceive.

Thus then it is manifest that the idea of space, time, and motion are all inseparably linked together. If we assume a real and distinct existence for one, we must assume it for all three. When, however, we come to the consideration of motion in the abstract, we shall find it involved in difficulties and contradictions analogous to those which attend the consideration of abstract space and abstract time. Relative motion we shall find it easy to apprehend and deal with. Beyond that, we shall find our path barred by obstacles as insuperable as those that prevented our realizing the ideas of space and time in the abstract. We must remain content with an imperfect idea; or assert that to exist of which we cannot even conceive the existence.

LETTER V.

MOTION.

IF we attempt to define motion, we can only do so by defining it to be a change of place by some object, relatively to some other object or place. When we see an object to be nearer to, or farther from some other, we say one, or both, have moved. If we see the change going on, step by step, we say the object is moving. Beyond this we shall find we cannot go; and that all our idea of motion is relative.

That motion, in the abstract, cannot be conceived a little reflection will show. If one sole globe be imagined to exist in boundless space, we cannot imagine it to move, without the aid of something collateral. If, for instance, we mark in some way the place it occupies, we can conceive it to have moved, or to move, to another place; but this is not motion in the abstract. It has only moved relatively to the place we marked; and, without that mark, this conception of motion would have been impossible.

If there be force in reasoning, therefore, we must conclude that motion, abstractedly, is impossible, for on what rational ground can we conclude that to be possible which is totally inconceivable? This is the conclusion at which Bishop Berkeley arrives; and I must confess I cannot see how his logic is to be impugned. This, however, is only a small portion of the difficulty connected with the subject. If we inquire into the cause of motion, we shall find strange obstacles at every step.

If we assume the real existence of matter, or material substance, we must assume it to exist as defined by those who assert the reality of its existence. The qualities attributed to matter are solidity, extension, and figure. Colour as a secondary quality is also attributed to it; and so, likewise, is gravitation, or the capability of being drawn

towards a centre of attraction ; and mobility or the capability of being moved. In these attributes, however, there is nothing that, in the least degree, goes to indicate a power of self-motion in matter. That which is called the evidence of our senses proves the direct contrary. It seems to teach us that matter in a state of rest continues in that state, until some impulse from without is applied to it. It then moves in the direction of the impulse given ; and, as far as we can judge, would continue so to move, were not some counteracting force to destroy the effect of that impulse. Thus, a cannon-shot, projected in a certain direction, would go on in it for ever, were it not for the combined counteraction of the earth's attraction and the resistance of the atmosphere, which destroys the impulse given by the gunpowder. But in this supposition of impulse from without being necessary to the motion of material bodies, are involved more than one difficulty, which seem to be insurmountable.

If it be admitted, as I think it must be admitted, that, to enable one substance to act upon another, they must have some properties in common, then that which acts upon material substance must have the qualities of extension and solidity. In short it must be material in its nature. We have already seen, however, that all evidence proves that in material substance no self-moving power is inherent : or in other words no power of commencing motion. This being so, we are at once driven upon the question—How, then, did the first motion of a material substance originate ? Being the first, it could not originate by being communicated through the action of some other material body. How, then, did it originate ?

To this question there is only one answer possible. We are driven to admit that which seems inadmissible, that is to say, that matter must be moveable by mind ; or, in other words, by something that has no qualities in common ; that has neither extension, solidity, nor shape, nor any relation to space or to place. Thus, take it which way we will, we are met by difficulty apparently insuperable.

Nor is it possible to avoid these contradictions unless we boldly deny, altogether, the existence of material substance, including, of course, our own bodies. This is very evident, because admitting the

union of body with mind, soul, or spirit, we must admit that the mind commences, causes, directs, and controls our bodily movements. Thus I see something at a distance which arouses my curiosity; and I am inclined to approach it. I do so by going through the action of walking, but in doing so my limbs are moved by my will, which causes not only the walk but controls its direction. But "to will" is the quality of an immaterial substance, having no quality in common with matter, having neither extension nor solidity, nor any relation to place or locality at all. Who can explain this? It is a common phrase to talk about the "separation of soul and body," or "the junction of soul and body;" but the expression, when analysed, is destitute of meaning. That which has no relation to place, cannot be in any particular place; and a soul can no more be said to be in a man's body than in that of any other man, or in that of the man in the moon. In short, it cannot be affirmed to be anywhere, being destitute of all relation to locality. Yet, when we talk of the acts or motions of men, or of the inferior animals, we are compelled to refer and attribute them to something mental.* In the limbs themselves there is no power of motion; and to the will of the animal, or some other will, we must attribute the acts of the animal. Such are the contradictions into which the attempt to mix corporeal with immaterial existence inevitably plunges us.

It is known, moreover, to anatomists, and indeed to all who have even a smattering of physiology, that there are certain muscular and corporeal motions, of more than one kind, which occur quite independently of the will, as far as the truth can be ascertained. If so, then upon any material hypothesis, as it seems to me, they must be entirely inexplicable, unless it can be shown that some other will is the moving cause. But even this does not overcome more than a part of the difficulty. How is the will of some other external being, which has no quality in common with matter, to give motion to a material muscle, or any material organ of a human body? Here we have the difficulty

* That mental excitement not only causes but modifies muscular motion is manifest in maniacs, who are, when excited, preternaturally strong.

of externality to deal with, as well as the want of qualities in common; puzzle added to puzzle.

Besides these difficulties as to the origin of motion, there are others as to its nature equally strange. It cannot be denied that, when anything is moved, it can only be moved in one given direction. That direction may be changed perpetually; but the thing moved can only move in one direction at once. This seems quite undeniable. What, then, must be the motion that is circular, and what must a circle be when described? Clearly, an infinitesimal collection of right lines, the direction of which has been constantly changed. A circle, in short, must be a polygon, of an infinite number of sides. This must be true of the smallest circle as well as of the largest; and from the same reasoning it follows that all curves must be composed of right lines, infinite in number. To what strange conclusions does not the assertion of the real existence of space, matter, time, and motion lead us!

That Sir Isaac Newton, Leibnitz, and their followers have, in their treatment of fluxions, involved themselves in the same insuperable difficulties Bishop Berkeley has, in his "Analyst," and his "Defence of Freethinking in Mathematics," completely demonstrated. I shall first, in order to make this clear, transcribe, from "The Analyst," the Bishop's statement as to the nature of fluxions, and then remark upon the utter fallacy of some of the assumptions involved in the fluxional method. The Bishop thus describes them:—

"Lines are supposed (*Introd. ad Quadaturam Curvarum*) to be generated by the motion of points, planes by the motion of lines, and solids by the motion of planes. And, whereas, quantities generated in equal times are greater or lesser, according to the greater or lesser velocity wherewith they increase and are generated, a method hath been found to determine quantities from the velocities of their generating motions. And such velocities are called fluxions; and the quantities generated are called flowing quantities. These fluxions are said to be nearly as the increments of the flowing quantities generated in the least equal particles of time; and to be accurately in the first proportion of the nascent, and in the last of the evanescent

increments. Sometimes, instead of velocities, momentaneous increments or decrements of undetermined flowing quantities are considered under the appellation of moments.

“By moments we are not to understand finite particles. These are said not to be moments, but quantities generated from moments; which last are only the nascent principles of finite quantities. It is said that the minutest errors are not to be neglected in mathematics; that the fluxions are celerities not proportional to the finite increments though ever so small: but only to the moments of nascent increments, whereof the proportion alone, and not the magnitude, is considered. And of the aforesaid fluxions there be other fluxions, which fluxions of fluxions are called second fluxions. And the fluxions of these second fluxions are called third fluxions; and so on: fourth, fifth, sixth, &c., *ad infinitum*. Now, as our sense is strained and puzzled with the perception of objects extremely minute, even so, the imagination,—which faculty derives from sense, is very much strained and puzzled to form clear ideas of the least particles of time, or the least increments generated therein; and much more so to comprehend the moments, or those increments of the flowing quantities in *statu nascenti*, in their very first origin or beginning to exist, before they become finite particles. And it seems still more difficult to conceive the abstracted velocities of such nascent imperfect entities. But the velocities of the velocities, the second, third, fourth, and fifth velocities, exceed, if I mistake not, all human understanding. The further the mind analyzeth and pursueth these fugitive ideas, the more it is lost and bewildered; the objects, at first fleeting and minute, soon vanishing out of sight. Certainly, in any sense, a second or third fluxion seems an obscure mystery. The incipient celerity of an incipient celerity, the nascent augment of a nascent augment, *i.e.*, of a thing which has no magnitude; take it in what light you please, the clear conception of it will, if I mistake not, be found impossible: whether it be so or no, I appeal to the trial of every thinking reader. And if a second fluxion be inconceivable, what are we to think of third, fourth, fifth fluxions, and so onward without end?”—ANALYST, *Paragraphs* iii. and iv.

The Bishop having shown the absurdity of supposing, and the impossibility of conceiving, an infinite series of decreasing points, each less than the other, yet having no magnitude at all, nor, if added to a finite point, causing any increase in its magnitude, next attacks the method of fluxions, as attempted to be demonstrated by Newton, and proves, from his own principles, that it is erroneous. Those who are versed in mathematical reasoning, and who are curious to judge for themselves of the power with which Berkeley assails Newton's method, I must refer to the pages of "The Analyst," where his objections are fully stated in various forms of mathematical analysis. I shall, however, give one example of the Bishop's reasoning, and leave mathematical readers to judge for themselves as to the accuracy of his conclusion.

"From the foregoing principle, so demonstrated, the general rule for finding the fluxion of any power of a flowing quantity is derived.* But as there seems to have been some inward scruple or some consciousness of defect in the foregoing demonstration, and as this finding the fluxion of a given power is a point of primary importance, it hath, therefore, been judged proper to demonstrate the same in a different manner, independent of the foregoing demonstration. But whether this other method be more legitimate and conclusive than the former I proceed now to examine; and in order thereto, shall premise the following lemma. 'If, with a view to demonstrate any proposition a certain point is supposed, by virtue of which certain other points are attained: and such supposed be itself afterwards destroyed or rejected by a contrary supposition; in that case, all the other points attained thereby, and consequent therefrom, must also be destroyed and rejected, so as from thenceforward to be no more supposed or applied in the demonstration.' This is so plain as to need no proof.

"Now the other method of obtaining a rule to find the fluxion of any power is as follows. Let the quantity x flow uniformly, and be it proposed to find the fluxion of x^n . In the same time that x by flowing becomes $x + o$, the power x^n becomes $\overline{x + o}^n$, i.e., by the

* Philosophiæ Naturalis Principia Mathematica, Lib. ii., Lem. 2.

method of infinite series $x^n + n o x^{n-1} + \frac{n n - n}{2} o o x^{n-2} + \&c.$, are one to another as 1 to $n x^n - 1 + \frac{n n - n}{2} o x$, &c. Let now the increments vanish, and their last proportion will be 1 to $n x^{n-1}$. But it should seem that this reasoning is not fair nor conclusive. For when it is said 'let the increments vanish,' *i.e.*, let the increments be nothing, or let there be no increments, the former supposition that the increments were something, or that there were increments, is destroyed; and, yet, a consequence of that supposition, *i.e.*, an expression got by virtue thereof is retained. Which, by the foregoing lemma, is a false way of reasoning. Certainly, when we suppose the increments to vanish, we must suppose their proportions, their expressions, and everything else derived from the supposition of their existence to vanish with them.

"To make this point plainer, I shall unfold the reasoning, and propose it in a fuller light to your view. It amounts, therefore, to this, or may in other words be thus expressed. I suppose that the quantity x flows, and by flowing is increased, and its increment I shall call o , so that by flowing it becomes $x + o$ and as x increaseth, it follows that every power of x is likewise increased in a due proportion. Therefore, as x becomes $x + o$, x will become $\overline{x + o}^n$; that is, according to the method of infinite series, $x^n + n o x^{n-1} + \frac{n n - n}{2} o o x^{n-2} + \&c.$ And if from the two augmented quantities we subduct the root and the power respectively, we shall have remaining the two increments, to wit, o and $n o x^{n-1} + \frac{n n - n}{2} o o x^{n-2} + \&c.$, which increments, being both divided by the common division o yield the quotients 1 and $n x^{n-1} + \frac{n n - n}{2} o x^{n-2} + \&c.$, which are, therefore, exponents of the ratio of the increments.

"Hitherto I have supposed that x flows, that x hath a real increment, and that o is something; and I have proceeded all along on that supposition, without which I should not have been able to have made so much as one single step. From that supposition it is that I

get at the increment of x^n , that I am able to compare it with the increment of x , and that I find the proportion between the two increments. I now beg leave to make a new supposition contrary to the first, *i.e.*, I will suppose there is no increment of x , or that o is nothing, which second supposition destroys my first, and is inconsistent with it, and, therefore, with everything that supposeth it. I do, nevertheless, beg leave to retain $n x^n - 1$ which is an expression obtained in virtue of my own supposition, which necessarily pre-supposed such supposition, and which could not be obtained without it, all which seems to be a most inconsistent way of arguing, and such as would not be allowed of in divinity.”—ANALYST, *Paragraphs* xii., xiii., and xiv.

These paragraphs are but a specimen of the force with which the method of fluxions, as laid down by Newton and his followers, is attacked by Dr. Berkeley.

Those who wish to see his entire argument I must refer to his admirable tract, entitled “The Analyst;” to his tract entitled “A Defence of Free-thinking in Mathematics;” and to the tract entitled “Reasons for not replying to Mr. Walton’s full answer.” I cannot refrain, however, from quoting one of the concluding paragraphs of “The Analyst,” so entirely unanswerable does it seem to me to be.

“A point may be the limit of a line; a line may be the limit of a surface; a moment may terminate time. But how can we conceive a velocity by the help of such limits? It necessarily implies both time and space, and cannot be conceived without them. And if the velocities of nascent and evanescent quantities, *i.e.*, abstracted from time and space, may not be comprehended, how can we comprehend and demonstrate their proportions or consider their *rationes primæ* and *ultimæ*? For to consider the proportion or *ratio* of things implies that such things have magnitude; that such magnitudes may be measured, and their relations to each other known. But, as there is no measure of velocity except time and space, the proportion of velocities being only compounded of the direct proportion of the spaces and the reciprocal proportion of the time, doth it not follow that to talk of investigating, obtaining, and considering the proportions of velocities,

exclusively of time and space, is to talk unintelligibly ?"—ANALYST, *Paragraph xxxi.*

On this topic I have only one remark more to offer in this place, and I shall do it very briefly. It appears to me that persons who talk of infinitesimal or infinitely minute quantities, and of minute finite quantities, do so very inconsiderately. They do not seem to be aware that we know no more of abstract magnitude than we do of abstract time, or place, or motion ; and that a minute object is only minute in consequence of the optical conditions under which it is seen. Infinitely minute things are only *quoad* the person who views them. To some other being, whose optics are differently constructed, they may be infinitely large. In short, our ideas of magnitude are all relative. Of positive magnitude we cannot know anything, as I shall prove when I treat of " Magnitude," in another letter.

LETTER VI.

MAGNITUDE.

To those who have never reflected upon subjects of this nature it will appear passing strange to assert that we have not, and cannot have, the slightest idea of magnitude in the abstract; but such is the truth. All that we know of magnitudes is their relation to each other; but as to the positive, abstract, magnitude of any single object we cannot form the slightest judgment. This is so, because magnitude is a visible impression, and is governed by the optical conditions of the being who sees. Hence, if we confine the enquiry to one single object, we cannot be sure that any two men see it to be of the same magnitude. To me it may appear of a size double of that which you see it to be, without our having any means of detecting the discrepancy. This is because each of us sees all other objects in the same way; and hence the relative magnitudes of objects, as compared with each other, are correctly judged of by each, whilst such comparisons give us no help to detect the difference as to abstract size which may exist.

Thus, I and another may sit in a room, of which the measured length is twenty feet, the width fifteen, and the height twelve. The three windows may be in a certain proportion to the height of the wall; and the tables and chairs in a certain proportion with the size of the room. Relatively the room and its furniture are the same to each, but may not be so in the abstract. The foot-measure, by which the whole is determined, may, in the abstract, be seen by him as of twice the size which it appears to me to be. There exists no means of detecting the discrepancy, because each sees everything else under the same optical conditions, and the relative magnitudes of all are correctly seen. To each the foot consists of twelve inches. To each

the yard is divided into three feet. Relatively to each other, I am five feet six inches in height, and he six feet high; yet, in the abstract, I may appear to him eleven feet high, taking the feet as I see them, and he may seem to me only three feet high, taking the feet as he sees them; but were this so, we have no possible means of knowing it.

In order to obtain a correct notion of the impossibility of our knowing anything about abstract magnitude, let us suppose a solid globe of the magnitude which we assign to the earth, or to the moon, to exist solely in space. Let us suppose this globe to be subjected to the mental view of any human being, at some given distance—say ten diameters. Let us further suppose that this is the only material body ever brought under his cognizance, not excepting his own body, and that he thus contemplates matter and infinite space for the first time. It is clear that, under such circumstances, no human mind could assign any magnitude to that which he saw. He would not have anything with which to compare it; and where is he to obtain any idea of its magnitude in the abstract?

In fact, under the supposed circumstances, every attempt would bewilder him the more. If he drew nearer, it would grow larger. If he went to a greater distance, it would be visibly less. As the distance varied, so would the visible magnitude. How was he to determine which of all these possible magnitudes was the true magnitude? Thus to attain any idea of abstract magnitude seems to be totally impossible, whilst of relative magnitudes our idea is full and complete.

Suppose, for instance, that, instead of one globe, there were two globes; the lesser one-third the size of the greater. In that case, the supposed spectator would see tolerably correctly the relative sizes of the two. He would see that the lesser globe was one-third only, or about one-third of the magnitude of the larger globe; and this he would see with equal correctness at all distances. As to the positive size of either, in the abstract, he could not determine anything. But of the magnitude of each, relatively to the other, he would obtain an approximately accurate notion.

The difficulty of comprehending this undoubted impossibility of our forming any judgment as to the positive magnitudes of material things, in the abstract, resides in the constant habit we have of assuming that, because men see the relative sizes of objects of sight alike, they must, therefore, see such objects of the same size, in the abstract, and taken singly; for which assumption there is not the slightest ground in reason. We forget that as to our perception of size, in the abstract, the whole depends upon the optical conditions of him who sees, and also upon distance which really alters magnitude, as we shall see afterwards.

Let us first consider the question of optical conditions. Take for instance the optical conditions which appear to be common to the human race. We all see a drop of water to be comparatively small, and so small that we may perceive its general colour, but not the more minute objects contained in it. To this our optical conditions appear to be limited. If, however, we subject this drop to the action of a solar microscope, through the mechanism of which these conditions, relatively to the drop of water, become altered, we are enabled to perceive the living creatures which inhabit it. We perceive the water-tiger seizing his prey; we can detect the blood of the victim; and in this drop of water become cognizant of a little world. All this time we have assumed that the optical conditions of the spectators are, in each case, identically the same.

Let us vary the supposition, however, and imagine that, amongst the spectators is one whose optical conditions are such that, in ordinary, a drop of water is seen by him as large as the solar microscope causes it to appear to the others, but without any extension of visual range: and that, in his case, when the solar microscope is used, the drop of water is magnified in the like proportion, and all the consequences follow as before. The drop of water, to him, becomes peopled, and he is enabled to see the water-tiger and his prey, just as the others do. In that case, it needs little reflection to perceive that this difference in the abstract magnitudes of things could not be detected. The drop of water, to him, would be the mere drop it was to the others, as he would see everything else in

proportion. He, like the rest, would require the aid of the solar microscope to view the water-tiger: and all the relative magnitudes being preserved, no difference in the abstract magnitude could be detected by any conceivable means; for, even to conceive detection, we must assume the range of vision to be extended, in the case of the last spectator, as well as the optical condition altered; so that he may be able to see, in his drop of water, objects too minute to be seen by the rest. This, however, is at variance with the original supposition, by which a mere alteration of optical conditions is assumed, and not an extended optical range.

Beyond the impossibility of our ascertaining anything as to the positive and abstract magnitude of any object, there arises another difficulty, caused by distance, by which the visible size is constantly being altered. Everybody knows that when an object is close to us it appears of a certain magnitude; but that in proportion as it is, or we are, removed to a distance, its visible magnitude becomes less and less, and any peculiar features, belonging to it, less and less distinct, until it, at last, disappears. Thus, then, visible magnitude seems to be the most uncertain of all things, inasmuch as it is not possible to say whether we ever see any object twice of the same precise and exact magnitude. For if magnitude, as visible to the eye, depends on distance altogether (which it does), then to see an object twice of the same magnitude, we must see it twice at precisely the same distance, which is hardly possible. Nor does it in the least lessen the difficulty to say that the difference may be infinitesimally minute, so as to cause no practical discrepancy. For although that may be true of ourselves, yet to a being, whose optical conditions were different, it might represent a large space, and cause a variation perfectly manifest.

It is clearly in consequence of this uncertainty of visible magnitude being universally, though tacitly, felt and admitted that we correct—or rather try to correct—our visible impressions by our tangible impressions, and resort to measurement to establish, as we think, the actual size of an object. Thus, if we are close to a tower which is forty feet high to the vision, we say we can prove it to be

really of the magnitude which it appears to the eye to be ; and we rear against it a pole, marked off into forty measured feet, which exactly reaches the summit. The tower we thus decide to be forty feet in altitude.

To this measure we confidently appeal, should any one, standing at a mile distance, deny that the tower could have any such altitude. We say, at once, this pole is the measure of its height ; and though to you, at this distance, it may be only four feet high, depend upon it, forty feet, as marked on this pole, is its true altitude. This, we add, you may ascertain for yourself. Take the pole, and go to the tower, and measure it, and you shall find it is so.

This passes for an undeniable proof of the actual magnitude, as to height, of the tower ; reflection, however, will show that it is no proof at all. It is merely a begging of the question at issue ; because the pole, when taken to the distance of a mile, is subject to the same visible diminution. When placed against the tower at the distance of a mile, it is still the measure of the tower's altitude, although the tower is now, to the eye, only four feet in height. Who, then, can determine the true altitude of either, in the abstract ? We know that, at like distances, they are each of the same relative, visible height ; but we cannot determine which is the true altitude of either, in the abstract. It is a mere gratuitous assertion to affirm that the visible altitude, when we are close to both, is the real and positive altitude. It is just as easy to affirm that the visible altitude at a mile distance is the real altitude ; and that, instead of distance making the visible altitude less than the real, proximity makes it larger than the real, to the eye. In short, both are assertions destitute of proof ; and the entire question of real and positive altitude remains in impenetrable obscurity.

There are other difficulties connected with the question of distances, which I must not pass without notice. It is known that persons born blind, but who have been relieved of the impediment to sight, cannot at first judge of distances. Every thing seems close to them ; and as if the surrounding objects were painted upon canvas, and they could touch the canvas. It seems pretty clear that this is the case with

infants also, although the fact cannot be absolutely and surely ascertained. Thus, then, it follows, that we judge of distances, not immediately, but mediately, through the instrumentality of something else; in short, by experience and induction. The question, therefore, demands an answer—upon what do we found our conclusions as to distances of objects?

If we apply to opticians, and those who treat of optics mathematically, for an answer to this enquiry, we shall be told that, both eyes being employed in vision, the angle formed by axis of the pupils, when the object looked at is near, is an obtuse angle. Whereas, when the object is distant, it is a more acute angle; and as the distance increases, so does the acuteness of the angle. When the object is looked at with one eye, a geometrical reason is also given, as an explanation of the means, in this case, of judging of distance. It is asserted that we judge of the distance by the greater or less divergence of the rays which, issuing from the visible point, fall upon the pupil. When the object is near, they are most diverging. When it is distant they are less divergent and nearer a parallel. The truth of these positions is not denied; but it is denied by Bishop Berkeley (*vide* ESSAY TOWARDS A NEW THEORY OF VISION, *paragraph ix., and onwards*) that these lines can possibly be the means by which we judge of distances; and his objections are these. Whether they be fatal to the theory or not the reader must decide for himself. I do not give the reasoning in the Bishop's own words; but I give the substance of it, as correctly as I can.

When (he argues) the mind perceives an idea not immediately, directly, and of itself, it must perceive by means of some other idea. If so, then that other idea must, first, be present and perceived by the mind, it being the medium through which the first is to be perceived. This is clear; for it cannot be denied that the converse proposition is true, *viz.*, that no idea, which is not, itself, perceived, can be the means of perceiving any other idea. But these lines and angles, by means of which mathematicians assert that distances are perceived, are not themselves perceived, or thought of, by those unskilled in optics. A boy, or an untutored man, who neither knows the meaning

of the word optics, nor of the word angle, nor of the word axis, has not the slightest idea of these lines and angles; and yet each of them can judge of distance as well as the mathematician. Hence, it follows, that the untutored man and the boy must perceive distances in virtue of something else than these lines and angles, which do not exist in nature at all, and are merely geometrical figments, only known to geometers.

Such is the reasoning of Berkeley; and I do not see how it is to be gainsaid. In fact, as it seems to me, we judge of distance by a gradual experience, by observing two or three collateral phenomena, and drawing conclusions from these phenomena as to probable distance.

In the first place, we argue distance from the difference it causes between the tangible idea of any object and our visible impression of it when distant. Thus our tangible idea of a tower assigns to it an altitude of forty feet. When at a distance, our visible idea of it makes it only four feet high. We deduce the distance from the difference between the tangible and the visible ideas. Again, we form a judgment as to distances from the faintness of the visible impression which the distant object causes. When the tower is distant, we cannot distinguish the loop holes, nor the embrasures, much less the joinings of the masonry, which, when near, were easily discernible. And, lastly, we draw conclusions as to distance from the range of visible objects between us and the distant object. All this, however, is matter of experience merely. The principal process, through which we come to a conclusion as to distance resides in comparing the tangible and visible ideas; and should the reality of the tangible idea be shaken, our conclusions as to distance must fall with it.

That ordinary persons do not see by geometry is credible enough. There is, however, reason to doubt whether opticians, themselves, really judge of distance by means of those axes and angles, which they assume to be the basis of their conclusions. The justice of this scepticism is evinced in the puzzle which mathematicians find in their attempts to explain the singular phenomenon of "the horizontal moon," which is familiar to everybody. The puzzle is thus stated by Bishop Berkeley. "The apparent magnitude of the moon, when placed in

the horizon, is much greater than when it is placed in the meridian; though the angle, under which the diameter of the moon is seen, be not observed greater in the former case than in the latter: and the horizontal moon doth not constantly appear of the same bigness, but at some times seemeth far greater than at others."

The existence of this phenomenon is universally admitted by mathematicians as well as by all others. If, however, mathematicians, and persons skilled in optics, really judge of distance by the obtuseness or acuteness of the angle, made by the axes of the pupils at the point of sight, how could they be subject to this delusion, the angle being the same in both cases? To this no answer has been, nor can be, given: and to explain the phenomenon at all seems to be as difficult to the most profound mathematicians as to others.

For the various explanations given by Descartes, Hobbes, Dr. Wallis, and by Dr. Berkeley himself, I must refer to the Bishop's Theory of Vision (*Paragraph lxvii. and onwards*); only adding that nothing there said appears to me to be satisfactory. If, after so many great authorities, I may venture an explanation of my own, I give it after this fashion.

Mankind cannot, strictly speaking, be said to have a tangible idea of the moon, because no man ever touched it: but from childhood, we are taught to consider it as a material sphere, at a great distance from us; and, therefore, we have, by analogy, a tangible idea of it. Now, when the moon is at the horizon, it necessarily appears, to us, much nearer than when at the meridian. It apparently touches the horizon; and we all know that the horizon is distant only a few miles. When the moon is at the meridian, we involuntarily imagine a vast space intervening. We place the moon amongst the stars, which we hold to be at a vast distance. Thus, when the moon's orb touches the horizon the conception of a vast uncertain distance is suddenly dwarfed; and a few miles of distance only are substituted. This, owing to our habit of connecting the apparent size of objects with their distance, compels the mind to give additional size to the moon, from the association of ideas which connects largeness with nearness. To understand this, we must reflect upon the undoubted truth that it

is the mind that sees, and not the eye. The eye is merely the medium (I am now speaking of it as a materialist) through which visible impressions are conveyed to the mind. This may be completely demonstrated: and when I come to treat of vision, and all the phenomena connected with the faculty of sight, I trust to make this clear.

LETTER VII.

VISION.

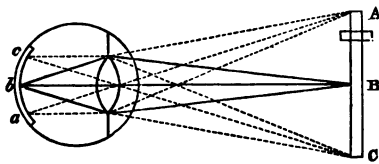
VISION may be defined to be the faculty of receiving visible impressions; which, according to the material theory, we receive through the medium of the mechanism of the eye. If we enquire what causes or originates these visible impressions, the ordinary reply is that they are caused by objects, of all sorts, round about us, which we see; and that the act of seeing and the reception of a visible impression are one and the same thing. Opposed as the conclusion may be to ordinary notions, a calm enquiry will show that this answer is entirely erroneous.

It is very easy to demonstrate, were it not universally admitted, that we see nothing but colours, and that we see them upon a surface, or plane, as we see a picture, painted upon canvas. It is admitted that we do not see a solid, although experience teaches us to infer a solid from certain appearances. This being, as it must be, admitted, it follows, of course, that we do not and cannot see any object directly and immediately. This follows, because it is manifest that although colour is called (improperly as I contend) "a secondary quality" of bodies, it is admitted that colour is not inherent in bodies at all, but is a property of the rays deflected from their surfaces and impelled in the direction of the eye of the spectator, which receives them. These rays are of different colours—some primary colours, some mixed—and these colours are the whole that the faculty of vision enables us to see. This, upon any theory of vision, is a very different thing from seeing objects directly. Different, however, as it is, vision is still further removed, for we do not see even the coloured rays directly and immediately. At the bottom or innermost part of the eye is an apparatus called "the retina," to which the optic nerve is joined from behind. This apparatus performs the part of a concave mirror; receiving the coloured rays after they pass

through the pupil; and upon the retina these coloured rays combine to form a picture, which alone is the object of sight. Thus all that we see is a picture painted upon a surface, a mere combination of colours; and our conclusions, as to the distances, solidities, and shapes, of visible objects, experience teaches us to infer from certain appearances of portions of this picture, which we combine with our tangible impressions of the same objects. Such, according to the material theory, is the apparatus for seeing objects, and the process in virtue of which they are beheld. Difficulties, however, remain, which this description of the ocular mechanism does not solve. In the first place it has been proved, beyond the possibility of denial or doubt, that this picture upon the retina which is all that we really see, is an inverted picture, or, in short, a picture turned upside down.

If we gaze at a landscape, the picture upon the retina, which is that which we see, gives the sky at the bottom, the earth at the top, and the trees and buildings all bottom up. The grand difficulty is to explain how it happens that we see these things in their proper position, though they are turned topsy-turvy in the picture upon the retina? A mathematical solution of this puzzle is given by Bishop Berkeley, as a quotation from Mr. Molineux (*DIOPTRICS, paragraph ii., c. 7, page 289*), which, up to this time is, I believe, held by those learned in optical science to be satisfactory; but which, I suspect, will satisfy few besides, and which is rejected by Dr. Berkeley, without ceremony. The passage runs thus:—

“In answer to this difficulty, we are told that the mind, perceiving an impulse of a ray of light on the upper part of the eye, considers this ray as coming in a direct line from the lower part of the object; and, in like manner, tracing the ray that strikes on the lower part of



the eye, it is directed to the upper part of the object. Thus, in the adjacent figure C, the lower part of the object A B C is projected on *c* the upper part of the eye. So, likewise, the

highest point A is projected on *a*, the lowest part of the eye, which makes the representation *c b a* inverted. But the mind considering

the stroke that is made on *c* as coming in the straight line *C c* from the lower end of the object; and the stroke or impulse on *a* as coming in the line *A a* from the upper end of the object; is directed to make a right judgment of the situation of the object *A B C*, notwithstanding the picture of it is inverted. This is illustrated by conceiving a blind man who, holding in his hands two sticks that cross each other, doth with them touch the extremities of an object, placed in a perpendicular position. It is certain this man will judge that to be the upper part of the object which he touches with the stick held in the undermost hand, and that to be the lower part of the object which he touches with the stick in his uppermost hand. This is the common explication of the erect appearance of objects which is generally received and acquiesced in being (as Mr. Molineux tells us) *allowed by all men* as satisfactory.

“But this account, to me, does not seem in any degree true. Did I perceive the impulses, decussations, and directions of the rays of light, in like manner as hath been set forth, then, indeed, it would not, at first view, be altogether void of probability, and there might be some pretence for the comparison of the blind man and his crossed sticks. But the case is far otherwise. I know very well that I perceive no such thing, and, of consequence, I cannot thereby make an estimate of the situation of objects. I appeal to anyone’s experience whether he be conscious to himself that he thinks of the intersection, made by the rarious pencils, or pursues the impulses they give in right lines, whenever he perceives by sight the position of any object? To me it seems evident that crossing and tracing of the rays is never thought on by children, idiots, or in truth by any other, save only those who have applied themselves to the study of optics; and for the mind to judge of the situation of objects by those things without perceiving them, or to perceive them without knowing it, is equally beyond my comprehension.” — *THEORY OF VISION, paragraphs lxxxix. and xc.*

This is one difficulty; but another remains. The impression of the picture on the retina is (say opticians) “conveyed to the mind.” How conveyed? The answer is, “by the optic nerve,” which is

connected with the retina. Thus, then, we are to believe that by means of a nerve, which is a material line of intercommunication, an impression is to be made upon an existence which has no one quality in common with material existence, as defined by materialists; which has no relation to space or place; which has no tangibility, no solidity, no capability of contact or material impulse; which has nothing to do with locality or nearness, and is no more in the head of the man, whose retina-picture it is to read, than it is in the moon. How this is to be effected it is impossible to conceive: nor is it much easier to imagine the meaning, which Mr. Molineux seems to wish to be affixed to the expression of the mind's "being directed to make a right judgment," as used in the passage quoted from the *Dioptrics*.

Taking the entire context, the meaning seems to be that the mind, at first, perceives the picture on the retina to be, as it really is, inverted; but, on second thoughts, reasoning from the direction of the pencils, comes to the conclusion that the inverted picture ought to be viewed as not inverted; and proceeds accordingly so to view it. This, however, is no explanation of the fact that we never, even for the fraction of a moment, see objects inverted. According to Mr. Molineux, the pencils must have done their work upon the retina before the mind can draw a conclusion from the direction through which they reached the retina. This, therefore, explains nothing, because, at setting out, the picture must have been seen inverted, be the time of seeing ever so short—which is not the case in point of fact.

Let us try to illustrate this. If the letters, forming a word, or words, be painted on the outside of the glass-pane of a window, a spectator, inside, sees the letters reversed, and discovers that, to read them, he must reverse the usual process, and read from right to left, instead of from left to right. In doing this his mind, doubtless, comes to the conclusion that, had he been outside, all would have been as usual, and the letters in their natural position. This, no doubt, he would at once do; but because he does this, are we to affirm that he does not see the letters reversed at all? This is, surely, out of the question, inasmuch as the fact of his so seeing them gives rise to his reasoning, and the conclusion based upon it. I do not

deny that, as soon as the conclusion is formed, the spectator sees the letters, in his mind's eye, in their natural position. But to impel a man to form a judgment, and then to form that judgment, some time, however short, must pass; and, during that moment, he must see the letters reversed.

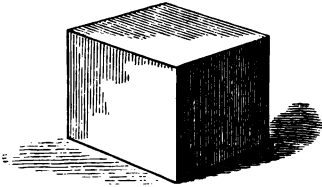
Rejecting the geometrical explanation, Bishop Berkeley gives a highly ingenious one of his own, which, though difficult of conception by minds untrained in metaphysics, is probably the true one. This solution is based upon another metaphysical truth, and that is that it is by custom alone that we learn to associate visible and tangible ideas together, and by thus associating them form conclusions which, without this process, we could not have formed. Thus it is by touch, chiefly, that we get our ideas of upper and lower. We stand upon the earth; we know that we do this by means of our feet and legs; and we say that the rest of the body is above, and is supported by them. Thus, when we see a picture of a man standing erect, we understand it through the medium of these tangible impressions which we have learned to connect with visible impressions. This seems to be undeniably true, as it needs no depth of reflection to see that there is not any necessary connection between the tangible idea of an object and its visible idea, and that we only learn, by experience, to associate the two together.

Admitting this, Dr. Berkeley argues that, in viewing the picture upon the retina, the mind finds nothing in the picture itself to give the idea of inversion. Everything there is in its right place. The figures and edifices stand upon the ground. The trees spring out of the ground, and all point towards the sky. If (he proceeds) the mind were necessitated to compare the picture with the tangible impressions of the spectator, such comparison would prove the picture to be inverted, in respect to the spectator's own position. This, however, the mind of the spectator cannot do. It takes the earth in the picture for the earth on which he is standing, and there is no inversion, then, in the case: for the inversion could only appear by his recurring to the tangible position of his own body, and comparing that with the picture.

This, however, we cannot do, because we find, on trial, it is

impossible to disconnect the visible earth of the picture on our retina and our tangible impression of the earth on which we stand.

That our visible impressions would be of little practical value, unassisted by our tangible impressions, is evident in the fact that, without the latter, we should not achieve the ideas of distance at all, but see all objects as if they were merely colours, painted upon a plane surface, and close to us, in short not without the mind. It appears very manifest—indeed, it is admitted, I believe—that the faculty of sight alone, without any aid from the sense of touch, could never give us an idea of solids. It is not easy to fancy ourselves, or anyone else, totally destitute of the sense of touch. But, if we imagine such a person to exist, and then imagine that he is made to see some solid object exactly three feet square, how is he, by sight



alone, to perceive that it is solid?

If he sees it directly, and not obliquely, he sees only the surface of one side, which suggests nothing more than a coloured plane. If he views it obliquely, he sees part

of the top and of another side fore-shortened. He, however, still sees them as a plane or surface, differently shadowed or coloured, and to the sight of one who never touched a square object, this difference would not suggest the slightest notion of a solid. Neither would the sight of the sides in succession help in the least. It would only appear an unaccountable succession of planes. In short, it appears to be sufficiently certain that without the aid of tangible impressions, those of sight would avail very little. We can only explain the one by means of the other; and in the case of magnitude in the abstract, both are equally powerless to open any avenue to knowledge.

There is another uncertainty as to vision, as connected with colours, which is somewhat puzzling, and a little mysterious. We see a certain number of colours, styled primary colours. We see others, formed by an admixture of the primary colours. That is to say, the majority of persons do this. There are, however, many known exceptions. Persons have been known who were unable to distinguish any colour but black and white. Others can distinguish

little else than yellow. Others only white, grey, and yellow. This known variation gives rise to doubts as to our impressions of colour on the whole.

In the "Philosophical Transactions" and elsewhere very curious instances of this difference in viewing and distinguishing colours are recorded. An instance is adduced of a tailor, who patched a blue coat with a bit of red cloth, deeming the two precisely alike. Whether he viewed the red as blue, or the blue as red, I do not know; but it must have been owing to one of these defects that he was led into the blunder. This is clear enough, but the dubiety does not end here. Whether he saw the red blue, or the blue red, how can we be sure that he saw that which he took to be red, or that which he took to be blue, as we see it? If this difference of view may be proved to exist as to a few colours in a few persons, how do we know whether much greater discrepancies may not exist, which we cannot possibly ascertain? In short, as in magnitudes, may not the relations between the colours that each of us sees be correct, but the colours themselves different? As, for instance, I may take two colours which I style respectively blue and yellow. I may mix them and style the compound green. Another may take two colours, deeming them the same as mine, and calling them blue and yellow, and mix them, and style the compound green. This may be, and yet it may remain a question whether each of us may not see the three colours differently, though the relations between the blue and yellow, and their capability of forming the compound green, may be alike in each case.

The various cases of dissimilarity in the view of colours, by different persons, demonstrates one important fact, that is to say, they prove that the view of a colour does not depend upon the colour exclusively, but also depends upon the optical conditions of the eye that views. If it depended entirely upon the coloured rays reflected from the cloth, the tailor could not possibly have confounded red and blue. Or, if we assume that the tailor's view may be the right one, then it follows that they who distinguish blue from red must be wrong. Such are the uncertainties involved in the phenomena of vision, whether applied to colours or magnitudes.

LETTER VIII.

SOUND, ODOUR, TASTE.

It has been usual amongst writers, who have written concerning material substance and its qualities, to call sound one of the "secondary qualities" of matter. If asked why? what is the answer? It is something like this. Sound is always produced by some material substance, and therefore it is fair to infer that it is a quality of matter thus far that it cannot be produced without it. For instance, a bell is struck smartly with a hammer, and a loud, sonorous tone follows. The sound, then, is a quality of the bell, under certain circumstances. This is an error. In order that the bell should emit, or seem to emit, a sound, it is requisite that it should be in contact with the surrounding atmosphere. If a bell be placed under a glass receiver, and the air pumped out, so that the bell is *in vacuo*, it does not emit any sound when struck.

Sound, then, is not a quality of the bell any more than it is a quality of the atmosphere: the last being as necessary to its production as the first. It becomes, on reflection, however, very questionable whether it can, with propriety, be defined as a quality of anything. If it be enquired what sound really is, and the mode of its production and action, we shall find it resolved into motion merely, and nothing else. The common theory is this. A bell is struck with a hammer, and by that collision a vibration, of a peculiar sort, is created amongst the particles of the metal, of which the bell is composed. This vibration, according to the theory, is communicated to the air-particles of which the atmosphere is composed, and continued all round to a greater or less distance. Any living thing, having the sense of hearing, and being within that distance, is affected by this vibration; the process being that this motion of the air-particles communicates

itself to the membrane of the ear, called by anatomists the "*tympanum*," or "drum," and thence, by the auditory nerve, to the mind, or sentient principle, of the human being, or lower animal, that hears. Thus, then, sound only becomes sound in the rigid sense, when perceived by the mind or sentient principle. Up to that time, it resolves itself into motion merely; that motion going through three or four stages; that is so say, first, that of the particles of the bell-metal; second, that of the particles of the atmosphere; thirdly, that of the atoms of which the tympanum is composed; and, lastly, that of the auditory nerve. All this, however, is motion, merely, and does not convey to us the slightest idea of sound, when described; but that sound is merely motion may be sufficiently proved in another manner.

If, for instance, a large glass vessel, of any kind, be struck, so as to produce its key-note, and a chord be, at the same instant, strongly played upon a violin or violoncello, the vibration of the glass is increased to so violent a pitch that it is sometimes broken, and sometimes shaken from the table. This experiment has been often tried: and it perhaps throws some light upon the cause of concords being so agreeable, and discords so disagreeable to a musical ear. It seems probable that the discord is rendered unpleasant to the ear by the vibrations in some degree jostling with and interfering with each other, as waves do in the case of that sort of roughness of the sea which seamen designate as a cross or short sea: a state of the water much more disagreeable and dangerous than a long and regular swell, where the rollers follow each other's course, and do not interfere or jostle with each other. Concords are, probably, made agreeable by this regularity and agreement of the vibrations with each other, which the discords destroy, substituting a vibratory contention in the delicate auditory membrane.

It is, further, to be observed that this question of concord and discord, as treated by musicians, is quite apart and distinct from any enquiry as to the quality or loudness of sounds, as to which there seems to be the same uncertainty as that attendant upon the question of abstract magnitudes. There cannot be any doubt that, in determining the loudness and quality of musical and other sounds, much

depends upon the auditory conditions of the particular ear which hears them.

It is quite certain that sounds which appear moderately loud, to ears of certain auditory conditions, are stunningly and overpoweringly loud to ears differently organised. It is well known that, during the celebration of Handel, in Westminster Abbey, by the most numerous band of musicians and singers, perhaps, ever got together, many persons fainted from sheer inability to bear the enormous volume of sounds; whilst, to others, it was extremely pleasurable. This must have arisen from the difference of the auditory organisation of the several parties.

The foregoing relates to the intensity of sounds. If we enquire as to the musical scale, we shall find it correlative with auditory condition, in the same way as magnitude is correlative with optical condition. It has been shown that sounds are produced, under certain conditions, so high in the musical scale that very many ears are incapable of hearing them. This want of capability was shown not to arise from any deficiency of loudness in the note; inasmuch as the same person could hear perfectly sounds just as faint, but lower in the musical scale. The inability clearly arose from the fact of the ear, in these cases, not being organised to hear notes so very high in the scale. Amongst other experiments in this direction, it has been discovered that considerable numbers of persons are totally unable to hear the note of the grasshopper, whilst it is perfectly audible to others. It is one of the shrillest sounds of which we have any knowledge; and as it should seem, too high in the scale for certain organisations of the ear.

Thus, then, it seems manifest that, as all our knowledge of extension and of magnitude is relative only, so all we know of sound is relative only. We know the relation, in the musical scale, which one note bears to another; and we know the relative intensity, or loudness, of one sound when compared with another sound. But neither of the range of the musical scale in the abstract, nor of the range of intensity of sound in the abstract, can we know anything. There may be organisations under such conditions that, to them, the treble

of the grasshopper would prove too low in the scale to be audible. There may be others, so conditioned that, to them the lowest tone in the scale, audible by us, may be too high to be heard. And as, in the question of abstract magnitude, it was clear that we could only be sure of the relations of magnitude, without knowing anything of the magnitude, in the abstract, which any object bore in the view of any given person, so, in the case of the musical scale, we only know the relations which the several notes, forming the octave, have with each other, but we do not know how each note is heard, in the abstract, by any ear. I hear the note A at a certain pitch, using the term in its most extended sense; but I cannot know the pitch at which another ear may hear the same A. Could he hear A as I hear it, and could I hear A as he hears it, we might discover that the two differed widely in the abstract. But this we cannot do; and hence that which is called "pitch" by musicians cannot be known in the abstract, extended, sense. The note A, in each case, has the same relation to the other notes of the scale; but, taken singly, the note A may be heard differently by every ear, in accordance with some peculiar organisation, without the difference being discoverable—although it may possibly be very great.

There exists one other peculiarity in sounds which ought not to be passed unnoticed, and which is quite distinct from any consideration of loudness, or of position in the musical scale, I mean the quality of certain sounds, which seems to be determined by the instrument by which the sounds are produced. Everybody, for instance, recognizes the wide difference between the sound of a German flute and the sound of a trumpet, without any reference to the note played, which may be the same in each case. One is allowed by all to be sweet, flexible, and mellow. The other, in comparison, is harsh, abrupt, and stunning. Again, there are sounds that produce that disagreeable effect on the nerves called "setting the teeth on edge"—an effect which seems to be produced by the quality of the sound, which quality is again determined by the mode in which it is produced. Shakespeare's description of it, put into the mouth of Hotspur, is incomparable.

"I'd rather hear a brazen candlestick turn'd,
 Or a dry wheel grate on the axle-tree;
 And it should nothing set mine teeth on edge—
 Nothing so much as mincing poetry."

To the quality of the sounds, thus produced, we must ascribe the effects to which the poet alludes. Still these qualities are relations merely. We cannot affirm anything positive of them. I readily allow that the sound of a German flute is sweet and mellow, relatively to that of a brazen trumpet, which is harsh and stunning. Another admits the same, yet the sound which he hears, as that of the flute, may be widely different, in the abstract, from that which I hear. This may be true, also, of the sound emitted by the trumpet; but in both cases the relation of one to the other is preserved, and that is all we know of the matter.

In fine, it follows, evidently, that, analyze sound as you will, it resolves itself into motion of some kind. It may be peculiar, and distinguishable from any other sort of motion; but there we are stopped. "We may be said to *feel* sound rather than to *hear* it" is the expression of Bishop Berkeley. It occurs in those dialogues entitled "The Minute Philosopher," which are a further exposition of the celebrated "Principles of Human Knowledge," and only second in point of talent to that extraordinary, unanswered, and unanswerable work. Berkeley is right. Sound never becomes sound until it reaches the mind, and is in the mind, as a mental sensation; and the relations which these sensations bear towards each other constitute the whole of our positive knowledge of it.

That sound is motion merely, until it is transformed by the sentient principle, may be proved by various experiments. In ordinary cases, when the vibrations are communicated to the atmosphere, the motion is extended in all directions, and becomes weakened in consequence. The speaking trumpet, by confining them, renders them stronger; and, upon the same principle, hollow elastic tubes are employed to convey messages to different parts of a building. When, however, a more substantial medium is employed, instead of atmospheric air, the vibrations are vastly stronger and their quality changed.

This it is very easy to ascertain by a simple experiment. A common poker, when struck against any hard substance, emits very little sound of any kind. If, however, a silk handkerchief be tied round it, and the ends of the handkerchief, after it is suspended, applied to the ears, it will, when struck against any hard substance, emit a strong, deep, resonant sound, like that of a large full-toned church bell; so strongly are the vibrations of the metal conveyed by the silk.

The phenomena of taste are more obvious than those of sound. They seem to depend upon the peculiar organisation of the palate in each individual, by which organisation is determined the sort of impressions as to the taste of anything, in contact with it, which is conveyed to the sentient principle. That the taste is not regulated by the kind of food or drink is evident in this, that the same substance causes a pleasant sensation of taste to one individual and the reverse to another. To most persons the flavour of caviar is disagreeable, yet some few persons are immoderately fond of it. It is the reverse with cheese, which is highly palatable to the great majority of persons, but which is, yet, so revolting to some, that they cannot have it upon the table with comfort to themselves. The melon, which is a highly flavoured fruit, is held generally either in high esteem or high disfavour. Few persons are indifferent to it. To many palates its taste is delicious; to a great many it is disagreeable. It is the same with olives, which to some persons are a favourite food, whilst others cannot be persuaded to taste them a second time. All these facts lean one way, and tend to prove that taste is in no quality of bodies, but resides in the sort of sensation, pleasant or unpleasant, which the palate, when in contact with them, conveys to the sentient principle. This is further evidenced by the fact, that, in certain states of disease, the taste is, for the time, entirely changed. Food that was agreeable becomes altogether distasteful; and the palate takes refuge in things to which, in health, it was quite indifferent.

That taste is a mental sensation is further demonstrated in the well known fact that blind persons, or persons whose eyes are bandaged may, by prepossessing the mind with the idea of some particular food, be deceived into fancying they taste it, when, in fact, they are tasting

something different. Some persons have been thus made to believe that vegetable food was shell-fish; and to confound the most opposite kinds of animal food with each other. These facts all unite to show that taste is a mental sensation; and that the palate and its nervous adjuncts form, merely, an intermediate instrument between the food and the mind.

Smell is very analogous to taste; the nostrils, with respect to odours, being the intermediate instrument between the substance that gives out the odorous particles, and the sentient or perceiving principle. And it is further analogous to taste in the fact that a peculiar taste may be sometimes described by a mere reference to a peculiar odour. Many persons hold that butchers' meat, when kept in a damp larder, acquires a taste which irresistibly brings to the mind the idea of the peculiar scent of the leaf of the geranium. This is the case with myself; and I have known more than one person conscious of the same analogy, or similarity.

As is known to be the case with taste, so is it with odours, that some which are agreeable to most persons are peculiarly offensive and overpowering to a few. This is the case with cheese and also with apples. Some persons cannot enter a room where either are kept. I have also known persons to whom the odour of the flowering shrub syringa was extremely offensive. It brought on a feeling of faintness. Musk, also, is not a scent agreeable to most persons; but it is so to a few. In short, all that is known seems to argue that taste and odour cannot be called qualities of bodies, but reside in the sentient principle of the human being or the lower animal affected by them.

As with sounds, so is it with scents that some are too delicate for the olfactory nerves of a few individuals; just as the chirp of a grasshopper is too high in the scale for the ear of individual persons. I have met with those who could not recognise the scent of the sweetbriar, though affected by other scents like other people.

One of the most puzzling circumstances, with regard to odorous substances, is the extreme subdivisions of matter which they seem to prove. A small bit of musk, it is affirmed, has been known to

perfume a large apartment for many years, without sustaining any appreciable diminution of weight. Yet we can, upon the material and commonly received hypothesis, only account for the fact by assuming that the musk has, during the entire period, been giving out minute atoms in sufficient quantities to keep the atmosphere of the room pervaded with them. This seems to involve the hypothesis of infinitesimal division. But we shall find, in the course of this enquiry, instances infinitely (if I may make use of such a word) more extraordinary.

From the foregoing reasonings and statements it must, I hope, be sufficiently manifest to the reader that one great and insuperable difficulty pervades the whole enquiry, if conducted under an assumption of the material hypothesis being true and demonstrable. This is the utter impossibility of conceiving how material atoms, or any substance composed of material atoms, should act upon immaterial substance, which has no quality in common with matter, which, in short, has neither extension, nor solidity, nor locality, nor any one attribute that we can conceive to act as a means of communication between the immaterial substance and the material body, whose attributes are comprised in being extended, solid, local, moveable, and visible.

LETTER IX.

ATOMS.

IF we are to assert the existence of matter or material substance, as defined, we shall find ourselves further under the necessity of adopting, in some shape, the ancient Epicurean theory of "Atoms." One seems to me to involve the other. No one has ever pretended to say that matter, in the mass, is solid and indivisible. If it be not, then of necessity it must be compounded of atoms, or very minute parts, held together in some way, in order to form the bodies which we term "solid." There is no other conceivable way to arrive at solids. If a solid be not solid in the mass, it must be compounded of solid, coherent atoms, or very minute parts; that is to say, if we are to allow that, in strictness, there is such a thing at all as a solid. I say if we are to allow there is such a thing as a solid at all—first, because no one has been able to produce one of these solid, indivisible atoms. Secondly, because it is not only certain that no actual contact between bodies, or parts of bodies, can be proved; but also that all evidence is the other way, and goes to prove that there cannot be any actual contact of the atoms which are surmised to compose solid bodies. Thirdly, because no intelligible account can be given of the mode in which atoms are held together to form solid bodies. Fourthly, because some philosophers have denied the existence of atoms, and resolved all solid bodies (so-called) into a congeries of centres of attraction and repulsion. Fifthly, because no one has, hitherto, pretended to know more of matter than its sensible qualities—such as extension, repulsion, attraction, shape, colour, relative magnitude, and capability of being moved; and although we cannot conceive any other medium of upholding these qualities, save the employment of atoms, yet a possibility remains of some other medium,

which may be inconceivable by us, and in consequence hidden from us. The existence of this possibility cannot be denied. If, ultimately, we find ourselves driven, by the difficulties and the absolute contradictions which the assertion of its existence involves, to abandon the theory of material substance in any shape, there must remain room for some other theory, not material, which may account, in some other way, for the impressions and ideas, of all sorts, which make up this world and its discipline. If it shall, ultimately, turn out that we are wrong in our notions of material existence, and its qualities and attributes, it would be absurd to conclude that a philosophical chaos must necessarily follow. There must, undoubtedly, be some way of accounting for all the phenomena with which we are conversant, although the human mind, at present, may not be advanced enough to penetrate the mystery.

In the very act of stating the theory of atoms, we find ourselves confronted by a difficulty. They are held to be infinitely small, but are indivisible, and solid, or impenetrable atoms. Now putting aside the undeniable fact that the existence of atoms is a mere gratuitous assumption, and that no man has ever been able to produce one of these atoms, we are compelled to ask in what sense it can be held to be indivisible? We have already seen that of magnitudes, in the abstract, we can form no idea. It has plainly appeared, on investigation, that our ideas of magnitude are all relative only. It is, then, in vain to talk about infinitely small or infinitesimally minute atoms. To us they possibly may be so, or be held to be so: but to another being of different optical conditions they may be the reverse. Infinitesimal or not, however, if they be solid, they must be of some shape and some colour; and shape and colour involve extension. They are inconceivable without it. We have already seen, however, that extension is infinitely divisible, and that we cannot conceive extension, however minute, that is not capable of infinite division.

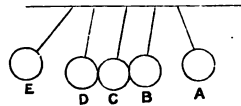
Thus, then, it appears to be sufficiently plain that atoms can only be indivisible in this sense, that we have no microscope that can enable us to see them, and no instrument that would enable us to divide them, when seen. Yet, in talking thus, we talk contrary to all fore-

gone experience. No material substance has yet been met with which may not be divided, or decomposed, by means contrived by human ingenuity, or else discovered by human observation. So that an impenetrable atom, if ever one can be made cognizable by our senses, would be unique in physiology ; in short, a kind of standing miracle.

Leaving this portion of the question, and admitting, for the sake of the argument, the possible existence of indivisible atoms, of which solid substances are supposed to be formed, we come to another difficulty, and that is to understand how they are held together, and made to form the shapes assumed by solid bodies ? This difficulty is two-fold. In the first place, although attempts, innumerable, have been made to achieve it, no proof has ever been given that the atoms, said to form solids, are really in actual contact with each other, or that there is such a thing as contact betwixt one solid and another. In fact proof, hitherto, has established the contrary. All substances, hitherto met with, may by a certain amount of pressure be made to occupy a less space than they naturally occupy. This could not be, if the impenetrable atoms, of which they are held to be composed, were in actual contact with each other. Nor have the surfaces of two solids ever been brought so close together as to preclude the intervention of all other bodies, fluid, liquid, or solid. Neither is there any solid through which something may not be made to pass. Heat penetrates everything, and light passes freely through some substances, glass and diamonds for instance, which are transparent, though highly solid. To this it may, indeed, be objected that some persons have denied light and heat to be substances at all ; but have held them to be motions merely of a supposed invisible ether, or else of the atmosphere, communicated to the atoms of which bodies are formed. This, however, does not, if admitted for the sake of argument, obviate the difficulty. In fact, motion communicated to the particles of which bodies are composed proves non-contact, for to motion space is necessary. Without the idea of space, motion we have seen is absolutely inconceivable. If atoms move they must move in space ; but the presence of space round each atom negatives all possibility of contact ;

for were they in contact, each with those next it, motion would be impossible and inconceivable. To deny that light and heat are substances, whilst the denial involves other difficulties, does not, therefore, help us out of that arising from their passing through solids, which they could only do in any case, from the fact that the atoms, by which solid substances are said to be constituted, are *not* in contact with each other.

This truth seems to be demonstrated by the transmission of impulse or momentum, which is most easily observed when bodies of the closest and most solid texture are employed in the experiment of transmission. Thus, if we take five marble, or ivory, or metallic, or wooden balls, pierced through the centre so that they may be suspended, and suspend them in a line, in apparent contact with each other, we may, by this means, prove the transmission of motion or impulse. For, if we draw the ball A from the centre of gravity and then let it oscillate towards the other four balls, the motion or impulse so given, by its impinging upon B, will be communicated through B, C, and D, to E, which will fly off in the opposite direction. This is accounted for by saying that the motion given to A is communicated, through B, C, and D, to E; and this is generally received as a satisfactory solution, and there the enquiry drops. If, however, we investigate more narrowly and further, we soon find more than one difficulty, the facts appearing to prove two conclusions, each of which has its attendant difficulty. If we ask, in the first place, how the motion of A is transferred to B, seeing that no actual contact between A and B can be proved to take place? what is the probable reply? That, admitting this, there may be an intervening ether, very elastic (as held by Newton), through the motion of the particles of which the impulse given by A is conveyed to the atoms that compose the other balls. This, however, only shifts the difficulty. Because as all motion implies space, therefore it follows that the particles of this elastic ether cannot be in contact with each other, and the difficulty returns. For, if particles of ether, or atoms composing bodies, can



communicate motion without contact, they must act where they are not, which is inconceivable. Or else we must affirm that the motion of a body may be communicated to another body although there be a space betwixt the two absolutely void; an assertion of that which is inconceivable and impossible. Motion is a quality merely, and cannot exist abstracted from that in which it inheres, which is the thing moved. But motion, conveyed through void space, would be the motion of nothing, which is a contradiction in terms; as all motion implies something moved, and can only be perceived, or conceived, by the mind in connection with the thing moved. Thus, though the apparent transmission of motion through solids proves their atoms not to be in contact, it also proves a contradiction, that is to say, motion conveyed as a quality inhering in nothing, which is metaphysical absurdity.

If, leaving this portion of the subject, we proceed to enquire as to the mode in which, or means by which, the atoms, that are asserted to compose solid matter, are held together, we shall meet more difficulties. If we ask what it is that keeps together the atoms of which the terrene globe is supposed to be composed, we are told it is by the force of "the attraction of gravitation," or that tendency towards a centre, which is the cause of the downward pressure which is familiar to all; and which draws falling bodies towards the earth, with an accelerating velocity, in accordance with a given law. If we further ask what it is that holds together the atoms forming separate masses of stone, or metal, or wood, we are told it is "the attraction of cohesion," or that tendency to cling together which atoms have, when brought into close proximity with other atoms of a similar description. If we further ask to have a definition of the term "attraction," in order that we may comprehend the peculiar kind of agency, or mechanism, by which these phenomena are brought about, we find that word "attraction" gives us no insight whatsoever into the *modus operandi*, but is only a metaphorical term, employed to designate a certain fact, or phenomenon, without, in the least, explaining it; the term being merely compounded of two Latin words "*ad*" and "*trahere*," "to draw towards."

We further find that this inexplicable quality of "drawing towards them," is attributed to all masses assumed to be material; to the sun and moon, for instance; by the attraction of which latter the tides are apparently governed. The result, thus far, therefore, is that we have certain phenomena occurring under a certain law, but how brought about we do not know.

Taking the phenomenon, however, as it is described to be, it is not without its apparent difficulties. The attraction of gravitation seems to depend upon the magnitude of the attracting body. The sun, by its attractive power, balances the centrifugal force of all the planets, including that of the earth. The earth, in turn, regulates the centrifugal force of the moon and keeps it in its orbit. In these, and other instances, the action of the gravitating or attractive power seems to reside in the magnitude of the mass of the body which attracts. In the case of the atoms which compose the earth, this does not, however, appear to hold good.

When we enquire what it is which holds the millions of atoms which are deemed to help to form the terrene globe, we are told it resides in their being attracted towards a centre; or perhaps, in other and more intelligible phrase, in their tendency to press towards a centre. If we consider and try to find an intelligible meaning for these words, we shall (I think) have to conclude that this tendency resides in the atoms, and not in the centre. For what is this centre? It must clearly be a mathematical point, or else an atom infinitesimally minute, equidistant from the circumference of the globe. This is the only intelligible definition of a centre. But, if the attractive power is in the ratio of the material mass, it is not, apparently, possible that the millions of millions of atoms, forming the sphere of this earth, can be attracted and held fast by a mathematical point in the centre. And it is still more difficult to conceive that a mathematical point, in the sun's centre, holds together, not only the matter composing the sun, but further, balances and holds in order the centrifugal force of all the planets, and so retains them in their orbits.

There are, however, other considerations connected with this topic, equally puzzling to the mind, when it strives to arrive at a clear idea

of the process of attraction. It is not difficult to imagine a sphere, composed of atoms, ranged round a central point and pressing towards it in accordance with some law, until this accumulation of atoms shall form such a globe as is this earth. This it is easy to imagine; because the process is over and the work is now accomplished. But it is much less easy to conceive how this should come to pass, if we begin at the beginning. If we imagine the millions upon millions of atoms, assumed to compose this globe, scattered in space, not equidistant from each other, but irregularly and confusedly, it is hard to conceive that any one of these atoms can be more central than a thousand others; or how one should be selected, in preference to the rest which have equal claims, to be the centre of the forth-coming sphere. Neither can we conceive why one particular time should be chosen for this, in preference to all other possible times; nor why an innumerable, nebulous, congeries of infinitesimal atoms, scattered in space, should, at some specially chosen time, change its state, select a centre, and arrange itself into a solid globe. It is hard, indeed, to conceive how this should come about; yet such is the theory of "Nebulæ," or those masses of mist-like light which the telescope reveals, as if floating in infinite space.

The primary difficulty, however, of the doctrine of attraction is the impossibility of conceiving how matter can act where it is not. The common qualities attributed to matter are easily conceived by the mind. A child is not puzzled by extension, repulsion, tangibility, colour, weight, and shape. But these all inhere in the visible idea of material substance, and accompany it. Whereas, attraction is only a metaphor; or if it be not a metaphor, we must revive the old doctrine of "occult qualities," if that deserves to be styled a doctrine, which attributes to things qualities, not only unknowable, but inconceivable, unintelligible, and indefinable.

This difficulty had evidently been too much even for the intellect of Newton, who, in a letter to Dr. Bentley, says:—"It is inconceivable that inanimate, brute, matter should, without the mediation of something else, which is not material, operate upon and affect other matter without mutual contact, as it must do, if gravitation in the sense of

Epicurus be essential and inherent in it. That gravity should be innate, inherent, and essential to matter, or that one body may act upon another, through a vacuum, without the mediation of anything else, by and through which their action and force may be conveyed from one to the other, is to me so great an absurdity that, I believe, no man who has, in philosophical matters, competent faculty of thinking can ever fall into it." To this remark of Sir Isaac Newton it is proper to add that, even if contact could be proved, the *ligamen* between material causes and effects cannot be shown. We only anticipate effects from constant sequence. The effect follows the cause, and seeing this, the mind links the two together, without perceiving the actual mode in which the two are necessarily joined.

Newton assumed that an invisible, and elastic, and intangible ether filled all space, by which gravitation might be caused.* But how does this relieve the difficulty? Who can prove contact between particles of invisible, elastic, and intangible ether? or whence could they derive the force to act as the cause of the gravitation of bodies?

Some philosophers, in order to get rid of the atomic theory, have resolved matter into a congeries of centres of attraction and repulsion. But this is a desertion of the material theory altogether; attraction and repulsion are qualities only. They must inhere in something; and, if that something be a substance not material, the existence of matter is really denied and something immaterial substituted, to cause the sensations which we attribute to matter,—which may be the truth.

Before finally quitting the atomic hypothesis, it is proper to advert to some strange and inexplicable consequences of another kind, which are involved in it. The various chemical actions of various substances, in various combinations and in a variety of different circumstances,

*It is proper to observe that to talk of "filling all space" is merely to utter a contradiction in terms. Space is without limit. No limit to space is conceivable. But the term "all" involves limit; and is, therefore, inapplicable. Ether, being material, can only be conceived to be caused to exist in quantity, whether large or small. But all quantity, however extended, involves limitation. No possible creation of ether could, therefore, "fill" more than a limited space; beyond which there must still be space as limitless as before. Newton's expression, therefore, involves a plain contradiction.

have been laboriously investigated. The common method of accounting for these chemical phenomena, is to attribute different specific properties to different kinds of atoms and their combinations; but this hypothesis will not account for all. Modern chemists have shown that certain compounds containing precisely the same substances, in proportions almost the same, may possess qualities as widely apart as are the poles; let us take an instance:—"A radicle, named kakodyle, composed of carbon, hydrogen, and arsenic, C_4, H_8, A_1 , combines with oxygen in two proportions, both compounds being soluble in water. The protoxide of kakodyle, K, D, O , is one of the most deadly poisons; whilst the other, K, D, O_8 , has no poisonous action whatsoever, being the only known exception to the fact that arsenic, in all forms, is poisonous. The former compound contains 66 %, the latter 58 % of arsenic."

Here we have three well-known substances, in the proportions of 4, 6, 1, combined with oxygen in two proportions, differing from each other. In each case, therefore, we have the same substances, carbon, hydrogen, arsenic, and oxygen, in slightly different proportions. Yet one is rank poison; the other innoxious. There is nothing in the different proportions to account for this amazing difference in the action of the two compounds. In the innoxious compound there is about one eighth less of arsenic, and the proportion of oxygen is, I believe, greater. Oxygen, however, is not injurious when taken into the human stomach, in combination with substances that are themselves wholesome. Oxide of iron, for instance, is a common ingredient in mineral waters. When combined with copper or lead it does not cure the poisonous properties of these metals. There seems nothing, in short, in the slight variation of the two compounds to account for the deadly action of the first, as compared with the innocence of the second, or *vice versa*.

To account for it, we are referred to some difference of arrangement. Now, what is arrangement? Arrangement is the position, relatively to each other, of two or more atoms of different substances. This not very luminous term (I mean in such a case) requires two definitions. The atoms of two differing substances may be chemically

combined, or they may merely be mechanically mixed together. The results are very different in the two cases. The facts of chemical affinities are very curious, and not a little mysterious. Two substances, extremely different in qualities, have a specific tendency to combine and form a compound, the qualities of which are different from the qualities of either, singly. For instance, we take the substance commonly known as soda. It is the metal sodium combined with oxygen; an oxide; and, in that state, highly caustic, and a most destructive agent. When combined with carbonic acid, it is carbonate of soda, a mild substance which may be taken into the stomach safely. Here the arrangement is triple. First, sodium. Second, sodium and oxygen. Third, sodium and oxygen with carbonic acid. But the union is chemical; and chemical combinations are peculiar thus far, that they involve a change of qualities. Thus the union of carbonic acid and caustic soda neutralizes the causticity. Nor does any alteration, which increases the dose of carbonic acid, make any great difference. A bicarbonate of soda has nearly the same properties as carbonate. Both are innocuous when taken into the stomach, the action of which does not seem to disturb the chemical union of the substances.

The difficulty is to explain the change in the kakodyle, where a small alteration in the dose of oxygen changes a poison to an innocent mixture, and *vice versâ*, an innocent combination to a deadly poison. As a *dernier resort*, we are referred, for a solution of the puzzle, to a different arrangement: but by what power of fancy can we conceive an innocent compound to become a deadly poison, on the contrary, by merely changing the relative places of atoms, and altering C, H, A, O, into C, O, A, H, or into A, O, C, O, H? Or how is this order of precedence and relative position to be preserved, if the compound be decomposed in the stomach of an animal? Such are the difficulties of the Atomic Theory.

I must, finally, add that there has been one more quality attributed to atoms in the mass, for which there is no foundation, as it seems to me. This is the "*vis inertiae*," or force of sluggishness, or unwillingness to be moved; which, independently of gravitation, is attributed

to bodies. For this strange notion I cannot see the slightest rational ground. In many countries there are "rocking stones," or stones nicely poised, of many tons weight, which a child can move with ease, If we carry out the principle, we may suppose it possible to construct a pair of huge scales, hung upon a beam as nicely adjusted as are those used by chemists to weigh minute weights, which will go down with the addition of the hundredth part of a grain. If one hundred tons were placed on each, a child might move the whole with his finger; the increased gravitation of the descending being balanced by the resistance of the ascending scale. In these cases, where is the "*vis inertiae*?" Nowhere, as far as I can see.

LETTER X.

GERMS.

IF it be true—(and if it be *not* true, there is an end of all reasoning as to phenomena)—that there cannot be any EFFECT without a preceding or concomitant CAUSE, the theory of “Germs” must form an essential part of every material system which includes vegetable and animal life. In other words, every individual case of animal or vegetable existence must have arisen out of a sufficient cause, which cause preceded its existence. To this cause I apply the word “germ,” which includes in it the ovum which, in the matrix of the human female, is, through the energies inherent therein, developed into the human foetus, to be brought forth a human infant. Which includes in it the ova from which the quadrupeds, and other higher animals are developed and brought forth. Which includes in it the eggs of serpents and of birds, and the spawn of fishes, which are hatched by exposure to heat of some kind, whether animal heat or the rays of the sun. Which includes in it the eggs of insects; the seeds of trees, plants, and herbaceous growths; and the cells and buds, from which the microscopic tribes of minute zoophytes, protozoa, and confervæ, find origin, and are developed into almost endless genera and species, of some of which it is difficult to decide whether they belong to the animal or vegetable kingdom, or to both.

That all created things are only a long chain of ultimate causes and effects that which we denominate experience constantly teaches. No man, whose opinion is of any value on such a subject, has now the slightest belief in equivocal or spontaneous generation. Before the invention of the microscope, some minds had, no doubt, yielded to this absurd idea, driven to it by the then impossibility of examining the structure and habits of minute organisms; and not seeing the

mental chaos which must follow the admission of a notion so utterly untenable. This preposterous notion the perfected microscopic instrument has entirely exploded. To use the words of Dr. Carpenter, "We thus arrive at a period at which the whole embryonic mass is but a congeries of cells, all apparently similar and equal to each other; and, going still further back, it is found that all these had their origin in the subdivision of a single, primordial cell, which is the first defined product of the generative act."—*THE MICROSCOPE. Introduction*, p. 25.

This the microscope has enabled us to ascertain. Be it so; it is still self-evident that the primordial cell must contain the germs of the means necessary to work out, at the proper period, all the changes which follow. The budding processes, as well as the more complex generative processes, must have been in embryo in the shape of germs from the very first; for if not, these processes would be effects without causes—in short impossible contradictions.

Many persons extremely deceive themselves by fancying that they can conceive an effect to happen without a cause, because it is easy to conceive an effect without any visible or tangible cause. We see many phenomena, the causes of which are quite invisible and intangible as far as we are concerned. This happens to us perpetually. We see, for example, the phenomena of crystallization. We see plants grow upwards in despite of gravitation. The causes of these phenomena are, however, to us invisible. We are in total ignorance of their nature. We know not how, nor through what agencies they are made to appear. Yet, it is beyond the powers of the human mind to conceive of the crystallizing process, or of the growth upward of plants, without conceiving that they must be, and are, impelled by some governing causes to take the direction which they do invariably take. If we saw a substance crystallize for the first time, without having any prior knowledge of the subject on our part, we might attribute it to that which is vulgarly termed "chance;" that is to say, to causes which might not occur again. But when we see the process again and again, the conviction of a governing cause is irresistibly present to the mind; and by the law of this cause alone, can we conceive the

crystals to take their allotted shape, rather than some other shape, or rather than none.

Thus, then, in the successive existence of plants and animals, we find a long line of causes and effects, all inseparably linked together by a primordial law of causation, by the force and virtue of which the entire succeeding line is continued, governed, and regulated. This is the general law of germs. The generative act of animals and vegetables consists merely in supplying the stimulus which is to quicken into life and growth the seed, or egg, which already has existence, and awaits that stimulus to become, in its turn, a plant or an animal. And we must especially guard ourselves against receiving this statement as a general statement. It is quite the contrary. It is, to all intents and purposes, the very reverse. If we are to admit the doctrine of germs, as an explanation of the *modus operandi* by which animals and plants are made to succeed each other in a long connected series of alternate causes and effects, we must resolutely hold that every portion and member, however minute, of a plant or animal, exists in its germ in the state of embryo. This we must hold, in the most rigid and comprehensive sense; for if we do not, we shall, at once, be involved in the absurdity of admitting that something has come to exist without a cause, which, if once admitted, renders all further reasoning useless and vain. This being so, it must be further remarked that, as the ovarium of the female animal, and the seed-vessel of the plant, are all-important portions of each, they must have existed, in embryo, in the ovarium or seed-vessel of the parent animal or plant; and so on, upwards, until we arrive at the first female of each genus or species. From this reasoning, assuming the theory of germs to be valid, there is no apparent possible escape. We are conducted, therefore, by this theory to the staggering conclusion, that the seed-vessel of the first plant of any genus must have contained the embryo seeds of all the plants derived from that stock; and that, if, as we are taught, the human race sprang from a single pair, the matrix of the first woman, Eve, must have included the embryonic rudiments of all the human race, from the beginning to the end. Whether such a proposition as this be, or be not credible, it is for the adherents of the material theory to determine. As applied to the human race, it is

sufficiently startling. When carried further, the improbability becomes more unmanageable, even by the strongest imagination.

If we limit the duration of the human race to the period which has been commonly assigned, allowing two generations to each eighty years, and estimate the present population at a thousand millions, the numbers that have lived and died are enormous. Modern discoveries, however, seem to argue strongly for a much higher antiquity than the author of Genesis allows to the race of mankind. If men lived contemporaneously with the extinct mammoth, and rhinoceros, and cave-bear; and at an era when the urus, elk, reindeer, and great hyæna roamed over France and Belgium, remote indeed must be their date, and far beyond historic record or conceivable tradition. In this case, no data for calculating the numbers that must have lived and died since the creation of the first pair can ever be accessible, and the imagination gives up in despair. If we apply the same theory to some of the lower animals, to fish, to insects, and to vegetables, the results become still more bewildering. The prolificness of some species of fish is most extraordinary. In the spawn of a single cod-fish a million and a half of ovula have been counted; and in the spawn of mackerel above half a million. The seed-vessels of some plants are nearly as well stored. The seminal cells of some of the poppy tribe contain thousands of seeds; and it would be easy to select numbers of others, of the vegetable tribes, similarly furnished. If the rudiments, or germs, of all these are to be traced back to a single fish or plant, calculation shrinks from the task; and no powers of conception can embrace the idea of the myriads that must be included in the account. Yet this we must conceive to be possible, or else we must admit effects without causes, and so annihilate the very foundations upon which all reasoning must rest.

There remains to be noticed another consideration which further complicates this matter. In the body of man, and in those of the lower animals, there exist animalcules of various descriptions. When the foot of a frog is put under the microscope, not only is the circulation of the blood clearly seen, but in that blood animalcules, full of life, of an eel-like shape, are very distinctly visible.

In the seminal fluid of the human male "spermatozoa," or thread-

like animalcules, capable of motion, are found. By some these have been classed as infusoria. By others they are regarded as being scarcely animalcules, but as mere living cells, capable of motion, or *spermatozoides*.

In the blood, and in some of the organs, of various animals, however, beyond a doubt, true animalcules are to be detected. In the livers of sheep which die of rot numbers of living organisms like minute flat-fish are to be seen; and on the skin of persons afflicted with the itch, the microscope detects minute insects peculiar to the disease. To these facts it would be easy to add to a very great extent. This would, however, be a superfluous task. The question to be asked and answered is—how do these beings find their way into the bodies of the animals which they inhabit? This seems to be a matter of uncertainty entirely. It is easy to say, as some naturalists do, that the atmosphere is full of the germs, or minute seeds, or eggs of these beings; and that they find their way through the lungs into the interior of the animal which is their habitat; but of this no proof has been given, as far as I know, and the *modus operandi* is most difficult of conception. That the germs or eggs of worms which inhabit the bowels, such as the tape-worm, may be swallowed with our food is conceivable: but it is almost impossible to show how spermatozoa, or the animalcules which the microscope exhibits in the blood of a frog, find their way into the blood and into the *liquor seminalis*. This it is not easy to imagine; but the difficulty increases when we ask, how do the eggs of these animalcules find their way back into the atmosphere? and, how, in sufficient numbers to account for their constant occurrence where they are found?

There is a disease of the eye, known to oculists and medical men generally, which is extremely rare; so rare that few men have seen more than one or two cases, whilst the majority only know it through books. It is produced by the eggs of an insect lodging in the eye; but is so seldom seen that a case hardly occurs once in twenty years. The difficulty is to conceive how the seeds of this rare animalcule, or insect, find their way to the eye at all, if they come from without.

Taking the difficulties of both sides of the question into review,

it seems fully as rational to infer that the germs of spermatozoa, and other animalculi, whose habitat is within the body of an animal, exist originally in and are born with it, as to assert that they are derived from without. Unless the contrary can be actually proved, this assumption seems to me to be much preferable to, because much more probable than, the other. But its admission must be allowed to increase doubly, and triply, the improbabilities which attend the whole theory of germs.

If the germs of the spermatozoa of the human male are born with him, and form a part of his original economy, then it inevitably follows that the body of the first human female must have not only contained the germs of all the human race, her descendants, but, also of all the animalcules that were to come into the world and be developed in the persons of those descendants. This must, also, be true of the animalcules that are detected in the bodies of the lower animals, and of reptiles, if not derived from without. Similar difficulties seem, also, to apply to the origin of those minute parasitic plants, which are developed in or upon larger vegetable growths. The dry-rot in timber, for instance, is understood to be a minute fungus. It begins its ravages not externally, but in the heart of the piece of wood, and

————— “Mining all within,
Infects unseen.”

To all appearance, then, its germs must form an integral original portion of the tree; and if so, the first tree of this particular kind must have included in it, not only the germs of all the trees predecessors of this one, as well as of all others of the species in question, but of all the fungi of which dry-rot consists. This we must admit to be true; or else, we must, in some way, show that the seeds of the fungus-plant, that constitutes dry-rot, have found their way to the heart of a beam of timber, often closely covered up with plaster, or some other coating or screen, and inaccessible by the atmosphere.

These, however, are not the only difficulties connected with this branch of the material hypothesis. If it once be admitted that the

germs, or eggs, of animalcules, the habitat of which is the interior of an animal, are born with the animal and form an integral part of it, then comes the question, where are we to stop? If it be true, as it manifestly is true, that of magnitude, in the abstract, we have not any knowledge whatsoever, these animalcules, though microscopical in our view of them, may to some other vision be of large size, and large enough to include other animalcules having the same relation to them that they have to the animal in the interior of which they have their habitation; and so we may go on with an endless series of such assumptions, not one of which can be logically gainsaid. For, if we once grant that abstract magnitude is inconceivable, and that there cannot be such a thing as fixed magnitude, in any single case or instance, then there is no limit, nor can be any, to our possible suppositions as to magnitude in any given case; and the animalcule that, to our vision, is infinitesimally small, may to some other vision be infinitesimally huge. In short, it is useless to talk of abstract magnitude at all. We cannot be sure that our impressions of the abstract magnitude of any single object is the same for two seconds together: and whilst the relative magnitudes of visible things remain the same, it is impossible for us to be conscious of any changes in the general impression of magnitude, as applicable to the whole.

It would be improper, however, to quit the subject of germs without one concluding observation. We ought not, in any case, to be appalled by the mere consideration of numbers: because our ideas as to visible number are limited and insignificant in the extreme. Probably an extended power of forming visible ideas of great numbers of objects would, in this stage of our existence, be useless, and, in some respects, injurious. Be that as it may, it is certain that it is not easy to form a full and correct idea of twenty objects, even of one kind, say nuts or grains of wheat, unless placed, regularly, in some order. If thrown together, at random, it is very difficult to get the correct visible idea. This extreme limitation of our visible ideas as to numbers is, doubtless, compensated by our power of calculation and notation by means of arithmetical signs, which enables us to assign numerical places to an unlimited number of units, and, if we choose,

to subdivide it into parcels, the visible idea of which, severally, one by one, we could attain. Still our excessively limited faculty of forming correct visible ideas of any great number of objects of any kind, at once and simultaneously, is one of the most prominent imperfections of our nature. It may easily be shown to be useful in a certain direction, and never, perhaps, really injurious to us ; but, on the whole, we must take it for that which it is, a singular and striking imperfection. That which we have to guard against is our natural tendency to fancy a process, impossible to our limited faculties, difficult to the Creator, to whose mind all is clear, and who sees millions of millions with the same ease with which we contemplate a unit. The real argument against the theory of germs does not reside in the numerical difficulty. It resides in the improbability of the Creator's adopting a plan, so complex and circuitous to produce effects, which he might produce directly and simply, and which are yet imperfect and short of the end proposed. Those who can conceive that the germs of all mankind must have existed from the time of the first pair, only apply their theory to the material part of man. They do not assert that the mental portion, or souls of men, have also existed, all along, in or with these germs. Thus, then, according to this theory, half of the man, and that the valuable half, that is to say, "the soul," is not included in the germ. If so, when is it supplied?—when the infant is born, or when the ovum leaves the ovarium for the uterus?

LETTER XI.

LIGHT AND HEAT.

UP to a comparatively late date, heat and light were generally held to be material substances. Both were held to be exceedingly attenuated, that is to say composed of atoms infinitely small and not coherent, or only slightly so, as are the atoms of gaseous bodies. Between the atoms which constitute heat no difference has, I believe, been shown, or attempted to be shown. With light it is the reverse. Sir Isaac Newton proved—or is believed to have proved—by means of the prism, that light consists of seven primary colours or coloured rays, and that the mixture of these produces a white or colourless light. Hence, colour is styled by materialists “a secondary quality of bodies,” inasmuch as it is not inherent in matter itself, but is the result, merely, of the coloured rays reflected from the surfaces of material objects. Newton held both heat and light to be composed of atoms, having certain qualities: and he supposed the office of the sun to be to keep up a constant emission of these particles, so necessary to produce some of the most important phenomena which come under our notice—such as vegetation, liquefaction, &c. This opinion of Newton, as to the material nature of heat and light, was not, even at that time, acquiesced in by all. Huygens and others insisted upon it that light and heat were not atomic at all, but were the effects of peculiar motions communicated to a subtle ether which Newton and other philosophers assume to fill the space occupied by the solar system or rather visible universe. Of the existence of this ether not the slightest proof has ever been given. Newton seems to have assumed it because he admitted attraction to be incomprehensible and impossible, unless brought about through the medium of some intervening though unseen substance, and this fiction (for it is no more)

of a subtile ether was resorted to, because no other supposition would serve the purpose. I have limited the supposition to the solar system; because, as generally talked about, the supposition involves a direct contradiction and is utterly absurd, as we shall see. Huygens' reasons for differing from Newton do not seem to me to have any force; but the opinion, in spite of additional difficulties involved in it, is gaining ground; and heat and light are now being, like sound, resolved into motion.*

The theory of the material nature of heat and light has at all events the advantage that it is intelligible and easily conceivable, and does not involve anything trenching upon the absurd. Let us examine it, and this will be apparent enough; and to enable us to do this, I state it in the words of Professor Tyndall, who advocates the new theory, and describes heat as a "a mode of motion."

"Let us take the case of ice, and trace it through the entire cycle. The block of ice has now the temperature of 20° F. I warm it; a thermometer, fixed in it, rises to 32°, and at this point the ice begins to melt. The thermometer column, which rose previously, is now arrested in its march and becomes perfectly stationary. I continue to apply warmth, but there is no augmentation of temperature; and not till all the solid has been reduced to liquid does the thermometer resume its motion. It is now again ascending: it reaches 100°, 200°, and 212°. Here steam-bubbles show themselves in the liquid. It boils, and from this point, onwards, the thermometer remains stationary at 212°.

"But, during the melting of the ice and during the evaporation of the water, heat is incessantly communicated; to simply liquefy the ice, as much heat has been imparted to it as would raise the same weight of water 143° Fahr., or as would raise 143 times the weight of water 1° Fahr. in temperature and to convert a pound of water at

* As to the theory which resolves light into motion merely, it is only requisite to observe that we must either assume Newton's experiment, which separates the primary colours, to be a delusion, or we must conceive that the mixture of seven distinct sorts of motion produces an eighth sort of motion, which we designate "white," when it is deflected back upon the eye.

212° into a pound of steam at the same temperature, 967 times as much heat is required as would raise a pound of water 1° in temperature. The former number, 143°, represents what has hitherto been called the 'latent heat' of the water: and the latter number, 967, represents the 'latent heat' of steam. It was manifest to those who first used these terms that, throughout the entire time of melting, and throughout the entire time of boiling, heat was communicated; but inasmuch as this heat was not revealed by the thermometer, the fiction was invented that it was rendered 'latent.' The fluid of heat hid itself, in some unknown way, in the interstitial spaces of the water and of the steam."—*Tyndall's Lectures on Heat*, v., p. 147.

Now, as it appears to me there is nothing here that is at all unintelligible, or at all difficult to be conceived. If heat be a fine fluid, invisible to us under any circumstances, what difficulty is there in conceiving that it may, first, separate ice into liquid water, and then, by adding more, separate the particles of water into steam-fluid; this being done by keeping the watery atoms further apart, and filling the spaces with heat-fluid? The phenomena of combustion are, also, far better explained on the supposition that heat and light are bodies than under the reversed supposition. The commonly received theory was this: taking inflammable gas, or hydrogen, as the example. On the hydrogen being ignited, it rapidly combines with oxygen, and water is formed by the union of the two gases. As this is done, a flash of fire accompanies the chemical action: and this was held to consist of the heat and light liberated from their "latent" form in one or both of the gases, when the union of the two to constitute water was effected. This is surely no unintelligible solution of the problem. True or not, it has, at all events, the merit of clearness and probability. This, however, can hardly be affirmed of the more recent theory, which by its metaphysical darkness reminds us of the somewhat unintelligible philosophy of those worthies, termed "the schoolmen," of the middle ages. I quote Professor Tyndall's account of the theory, word for word.

"According to the notion, now universally received, light consists, first, of a vibratory motion of the particles of the luminous body;

but how is this motion transmitted to our organs of sight? Sound has air as its medium, and long pondering on the phenomena of light, and refined and conclusive experiments, devised with the express intention of testing the idea, have led philosophers to the conclusion that space is occupied by a substance almost infinitely elastic, through which the pulses of light make their way. Here your conceptions must be perfectly clear (!) The intellect knows no difference between great and small; it is just as easy, as an intellectual act, to conceive of a vibrating atom, as to conceive of a vibrating cannon-ball; and there is no more difficulty of conceiving of this ether, as it is called, which fills space, than in imagining all space to be filled with jelly. You must imagine the atoms vibrating, and their vibrations you must figure as communicated to the ether in which they swing being propagated through it in waves. These waves enter the pupil, cross the ball of the eye, and break upon the retina at the back of the eye. The act, remember, is as real, and as truly mechanical as the breaking of the sea-waves upon the shore. Their motions are communicated to the retina, transmitted thence along the optic nerve to the brain, and there announce themselves to consciousness as light."—*Lecture viii.*, p. 250.

Of this passage I can only say that, whosoever he may be who talks thus, no one needs to hesitate to say it is strange talking, and, moreover, inconsiderate not a little. In the first place, to talk of "all space being filled with infinitely elastic ether, or with jelly," is to use words without meaning. "To fill" is to occupy a given space with something so entirely that no more can be added. How is it possible to apply this to space, which is limitless? Had this filling gone on from all eternity, it would be no nearer its end than if it had begun yesterday. Whatever may have been filled in, a limitless void would yet remain to be filled, and this for ever. If, however, we suppose this "infinitely elastic ether," which no one has seen, touched, or smelled—to be limited to the visible universe, we shall find the theory built upon it inconceivable when closely examined.

If we assume that the sun, for instance, is composed of infinitesi-

mally minute atoms, it is easy to suppose these atoms subject, in some way, to that sort of motion known as "vibration," which is a rapid motion backwards and forwards. This is easily conceivable; but here we are stopped. How can this motion be communicated to the mass of the atoms composing the "infinitely elastic ether?" It is clear and undeniable that these atoms cannot be in contact with each other, if they are to move. I have already shown that motion without space is absolutely impossible to be conceived. It must also be borne in mind that the atoms of an "infinitely elastic ether" must be far further from contact than the atoms of any other substance; elasticity requiring space for expansion or contraction of the body which is elastic, in proportion to its elasticity. Thus, then, when at rest or in their natural state, the atoms of this "infinitely elastic" ether must be far from each other. In this, "elasticity" (so-called) consists; for the term cannot apply to a single, solid, indivisible, atom, of infinitesimal minuteness. We can only conceive an elastic body, of any sort, by figuring a substance, the atoms of which hang loosely together, and may, by force, be parted further; after which the attraction of cohesion (so-styled) brings them back, as in a steel spring.

If, then, it be admitted that the particles, or atoms, of this ether must naturally be apart from each other, the supposition is this. We must first assume that the atoms composing the sun are, in some way, by the Creator, made to vibrate those vibrations which are to give us the phenomena and sensations of heat and of light. In addition to this, it may be conceived that these vibrating particles, by coming in absolute contact with the atoms of the ether, cause them to move so strongly as to force them into contact with the next layer of atoms, and so on, until the motion is communicated to us. Even this is not easy of supposition, because contact of the particles composing any substance has never been proved by materialists; and because experience, on the contrary, has shown that the law of nature as to the forms and arrangements of bodies—(crystallization for instance)—are unchangeable and imperative. Admitting, however, that this is imaginable, it is difficult to conceive by what force, after once being

driven into contact with their next neighbours, the first atoms are sent back again to their original insulated position, to be ready to repeat the process. To conceive this process we must imagine, not only a principle of attraction, but also a principle of repulsion inherent in the same atom. First the atoms of the elastic ether are to be kept, by attraction and repulsion conjoined, at a given distance from each other. Then, if forcibly driven within that distance, repulsion is to succeed; and they are to be driven back again to their allotted station, to be ready to repeat this odd process. When we recollect that the existence of this infinitely elastic ether is, at best, a mere inference, destitute of any direct evidence of the fact, it is hard to see what is gained by a supposition involving so many difficulties. Newton hit upon the figment of a pervading ether to account for the attraction of gravitation. But, if bodies (as he held) "cannot act where they are not," how are the particles of this elastic ether itself held together, after a certain arrangement and for given purposes? The tortoise supports the elephant; but then comes the question, what supports the tortoise?

As the theory of transmission of heat from the sun is similar to that of light there is no need to repeat these objections. There are, however, other objections to the theory which resolves light and heat into motion only; and as to them I must say a few words.

The subject of latent heat, or latent light, has always been obscure—that is to say, though sensible enough as a theory, it has needed demonstrative proof. With all deference to the advocates of the notion which makes heat, and light also, only the mode of a mode (for motion is only a quality, and not a thing) I cannot see either improbability or difficulty in conceiving that light and heat, being attenuated fluids, might "hide themselves in the interstitial spaces of water and steam," or any thing else possessing "interstitial spaces." This, surely, is no very far-fetched supposition. I wish I could say as much for the more modern theory which, to my apprehension, is much nearer akin to a puzzle. I quote Professor Tyndall's own expressions:—

"It was manifest to those who first used these terms (*latent heat*)

that, throughout the entire time of melting, and throughout the entire time of boiling heat was communicated; but inasmuch as this heat was not revealed by the thermometer, the fiction was invented that it was rendered latent. The fluid of heat hid itself, in some unknown way, in the interstitial spaces of the water and the steam. According to our present theory, the heat expended in melting is consumed in conferring *potential energy* upon the atoms. It is virtually the lifting of a weight. So likewise as regards the steam, the heat is consumed in pulling the liquid molecules asunder, conferring upon them a still greater amount of *potential energy*, and when the heat is withdrawn, the vapour condenses, and the molecules again clash with a *dynamic energy*, equal to that which was employed to separate them, and the precise quantity of heat consumed now reappears."—*Lecture v.*, p. 148.

The first observation which this passage seems to require is this, that its force mostly resides in two words, which are here used after a totally new and unaccustomed fashion. These are the words: "energy" and "potential." "Energy" has, hitherto, been understood to mean that strength of will which enables us to persevere in the pursuit of any strongly desired object. But this sort of energy is a quality of mind, and can only be understood of mind. How can it possibly be applicable to an atom, the only qualities of which are shape, solidity, colour, and the capability of being moved by external force applied to produce such motion? To talk of energy being imparted—and to atoms—by the motion of the particles of an elastic ether, seems utterly absurd. Motion can only impart motion; and, in the act of being moved, there is nothing but what is passive. The mover may possibly possess energy, properly so called; but the thing moved is only obedient to a controlling power of force, and exerts nothing. The term "energy," then, applied as above, to atoms, can only mean motion, and can only mean imparted motion, and not motion originated by the atoms themselves. No meaning, other than this, is conceivable; and this being the case, what are we to make of the adjective "potential?"

Whatever may be the meaning attached by speakers, or writers,

generally, to the term "potential," it is manifest that, by the writer of the passages quoted, it is intended to bear one peculiar sense. It is made use of by him in a signification opposed to that of the word "dynamic." The molecules are said, "when the heat is withdrawn, to clash with dynamic energy." "Dynamic energy," then, means active motion. "Potential energy" must, consequently, be intended to mean the reverse of this,—that is to say, "inactive or unmoving motion," which is a direct and glaring contradiction in terms, and is no more conceivable than "black white," or "a circular square."

Thus easy is it to deceive ourselves and others by the mere use of words.

Here we see a clever man, merely in virtue of substituting the terms "energy," and "potential," and "dynamic," in place of the commoner words, motion, and active, and inactive, bringing himself to believe absolute contradictions. Of the same kind is the notion that by raising a weight a "motion-producing power" is conferred upon it. (*Vide Treatise on Heat, Lecture v., p. 137.*)

The fallacy here resides in the word "power," upon which an absurd meaning is put. That by being raised above the ground, a capability of falling, or being let fall to the ground, is conferred upon a weight, no one denies; so that by sending a man up-stairs, you can confer upon him the capability of being kicked down-stairs is certain enough; but who would dream of styling this "a power of being kicked, or of kicking himself down-stairs?" Not a jot of power of "producing" motion is, in fact, given to the weight, by lifting it. If the cord that sustains it be cut, it falls, or rather is pulled back again by the so-called attraction of gravitation, and by no motion-giving power, or energy, of its own. It no more falls by any act of its own, than the man is kicked down stairs by any act of his own. Had it never been lifted, and had a vacuum been suddenly produced underneath it, the fall would equally have taken place, yet, who "confers the motion-producing power," in this case? Such are the fallacies of language, used without a precisely defined meaning. By confounding a capability of being moved, by some external force, with a power of motion inherent in

that which moves, a flagrant absurdity is committed, on which I need not dwell further.

I have already shown that material substance, as defined, cannot be proved, nor even conceived, to have any power of self-motion. Certain substances, when placed in juxtaposition, are, no doubt, productive of consequences that include motion. But they must be brought there by the will and power of their Creator, or those of an inferior agent.

One remark more I must venture, before concluding. Motion being a quality, merely, cannot exist, abstracted from that in which it inheres. If heat be motion only, then it follows that heat cannot pass through a vacuum; because motion must be the motion of something. But that heat does pass through a vacuum has been amply proved. "Count Rumford (says Tyndall) contrived to hang a small thermometer in the middle of a glass globe, exhausted by means of mercury, and he found the calorific rays passed to and fro across the vacuum. Davy showed that the heat-rays from the electric light passed freely through an air-pump vacuum."—*Lecture viii., p. 244.*

Thus, then, we must either admit that heat must be something more than motion, or we must assume the existence of an ether, so attenuated that mercury cannot exclude it: an assumption totally destitute of proof, and resorted to merely to render apparently possible a theory impossible without this most questionable aid.

LETTER XII.

IDENTITY.

I HAVE now detailed some of the principal difficulties and objections that are involved in the material theory. It would be easy to add to the number ; but the foregoing are perhaps amply sufficient to convince the reader that the students of the Berkeleyan philosophy, as embodied in "The Principles of Human Knowledge," "The Analyst," the "Essay on Vision," and the "Dialogues," are not destitute either of fact or argument bearing on their side of the question ; and that materialism is far further removed from the "impregnable" than is commonly supposed.

I now, therefore, address myself to another branch of this very curious subject. I shall now state some of the facts, and comment upon some of the reasonings, which bear upon the other side of the controversy, and seem to make for the immaterial theory. They are not a few ; and, amongst others, by those versed in the vexed questions of metaphysics it has often been a matter of debate and question, in what consists "the ego?"—or, in other words, in what resides the identity of a human being, or indeed of any being capable of receiving sensations, however few, and endowed with feeling and consciousness, however limited ?

To many minds this question would, when first heard, appear a very simple—nay, indeed, a somewhat silly one. A little consideration may, however, convince such thinkers that it is, in reality, the reverse.

All human beings, whether they reflect upon it or not, are conscious of being each a living and sentient essence, distinct and apart from all other living essences ; in short, every human being is conscious of a certain oneness of being, which is incapable of modification or

change of any kind. Each man feels that he is "ego"—that is "himself," and that this oneness cannot be communicated; cannot be participated in; cannot be infringed; in short, that all and every one of us must be that which he is—or nothing. This, all human beings at least, be they male or female, feel and know, whether they reflect and reason upon the fact or not. The question to be answered is in *what* does this distinct personality, this oneness of our being, reside?

If we take the ordinary and received definition of man as formed out of the dust of the earth, and endowed with a reasonable soul, and enquire whether this oneness be a material or immaterial quality, we shall, I think, feel ourselves obliged to decide for the latter.

The identity of a man cannot reside in his material oneness, because it is capable of proof that there goes on a continual change in the atoms of which the body is asserted to be composed. In the frame of the old man there, probably, does not remain one atom which helped to form the body of the child; yet who, on that account, dreams of denying his identity? Who, on that account, would dream of denying that the mature man was identical with the boy, or the old with the middle-aged man? There have been human beings who have lost all their limbs, or who have been born without them; were they less human beings, or less themselves, on that account? No one will venture to say that. It seems clear, therefore, that the "ego" is not material in essence, and is independent of the bodily frame of man. Equally plain is it that it cannot be confounded with similitude, nor reside in any arrangement that is conceivable by the human mind.

It is not difficult, for instance, to imagine or assume that amongst the many systems which astronomers believe to exist in the visible universe, the fixed stars being really the central suns of these systems so assumed to exist, there may be one exactly similar to our solar system, having a world, similar to ours, in the same place relatively to the other planets, and subject to laws the same as those which control this, our terrene globe. This is not difficult to imagine; and equally easy is it to conceive that this other globe may contain men

precisely similar to those who have appeared here, in all and every respect. For instance, we may easily imagine that, upon this other globe has appeared a conqueror exactly similar to Napoleon, placed in the same circumstances, possessed of the same genius, running the same career, and subjected to every circumstance, great or small, to which our Napoleon was subjected. This any one may conceive. But is it possible, by any effort of mind, to confound the two, one with the other, and to conceive the other Napoleon to be our Napoleon? This it is manifestly impossible to do. Let any one who doubts try it in his own person. I, for instance, can readily enough fancy that this second terrene globe may contain a counterpart of myself, in all and every particular. This counterpart, or *fac-simile*, may be what in Germany is styled a "doppel-ganger;" nay, it may be more than that. In name, shape, disposition, talent, and temperament we may be exactly alike. We may act the same parts; share the same feelings; run the same course; and steer towards the same end; yet it is impossible for me, for even one moment, to conceive this duplicate to be myself. I can no more conceive this than I can conceive the next man I meet to be myself.

Identity, oneness, or the "ego," does not then reside in similitude of arrangement, nor in similitude of any description. In what, then, does it reside, for reside it must somewhere, and in something? I answer—in the consciousness of being, which is involved in being sentient; or, in other words, in the possession of the capability of receiving sensible impressions. For, with the first impression through any of the senses—tangible, or visible, or audible—that a sentient being receives, must come the consciousness of his capability of receiving it. In other words, he must at once feel and know, though without reflecting thereon, that he is a thinking being—an essence whose quality is thought, sole, indivisible, self-sustained, and distinct from all other sentient beings; not an arrangement of points and lines, or combination of atoms, or a fitted-up mechanism, but a sentient unit; not depending upon the presence of such qualities, or reputed qualities, as solidity, attraction, repulsion, colour, and shape, but endowed with one living principle of feeling and thought, to

which all the rest is subservient, and without which all the rest would be valueless and superfluous. In this consciousness resides the "ego;" for in knowing that I think, I cannot but know that it is I who so think: nor can this continuity of consciousness be severed or broken. That this consciousness of the oneness of our being is direct and intuitive is further evident in the fact that it does not admit of syllogistic proof, nor can be logically expressed even in a simple proposition. "I think, therefore I am," as given by Descartes, assumes, in the first assertion, the truth enunciated in the conclusion; nor is it possible to frame a syllogism proving this conclusion without being guilty of this solecism.

Thus, then, the oneness of the "ego" is a specific and peculiar quality, inherent in individual being. It cannot reside in mechanism, arrangement, or construction of any conceivable kind. It will not do to say of any mechanisms which are quite alike, here are two arrangements. This is a fallacy. There is only one arrangement. The atoms, or material, be it what it may, no doubt may be distinct in each; but the arrangement, in the abstract, is one and the same arrangement. Take away the material atoms and only one idea remains.

In dealing with this question there is another distinction to be made, which, although, on first view, it may appear subtle over much, and not easy to be understood, is yet, I believe, based on actual truth. In talking of the consciousness of existence which every sentient being must have, we are too apt to apply the term to ourselves, and to resort to our own experience for an explanation of it. This, however, is plainly a mistake. It is difficult for an adult and educated person to conceive the simple consciousness of existence, as it must exist in a newly born infant; because, with him, it has been so often a subject of reflection and reasoning that he cannot separate the reflective consciousness from simple consciousness. Yet it cannot be doubted that simple consciousness of existence, as it resides in a newly born child, is very different from the consciousness of a reflecting mind, which not only feels the truth, simply and abstractedly from anything else, but also recalls it and dwells upon it, as matter to reflect upon and then to reason upon. It is probable that the first sensation of an

infant is that of cold. But this sensation it cannot have without an accompanying simple (not reflective) consciousness of its own being. It must feel itself to be, at the same moment in which it feels itself to be cold. It is impossible to conceive the second to take place without the first. It is equally incapable of reflecting upon either feeling, when first experienced in earliest infancy; but still, surely, a knowledge of being must be involved in a knowledge of one of the consequences of being, and a feeling of cold cannot be experienced by any living being, without that being feeling and knowing, at the same time, that it is itself that is cold.

If we pursue this train of reasoning, we must, in the end, attribute to all classes of living existences, capable of sensation, that which we attribute to the infant of an hour old. The infant, during that time, cannot have experienced more than two or three tangible and visible sensations of the simplest kind, and is destitute, in this early stage of existence, of the power of reflection. When its hunger is appeased by its nurse's breast, and warmth supplied from the same source, it sleeps; or if, for a time, awake, its attention is occupied by visible objects, which, in its view, are mere unintelligible colours, and by the sounds which it hears without understanding or annexing any ideas to them. Thus, at first, the infant is upon a level with the lowest organizations. They do not, as it does, possess an inherent capability of further development; but, in other respects, no difference can be shown. We may predicate of both that which we may predicate of either for the moment; and, therefore, we may attribute to the mollusc the same simple consciousness of existence that we attribute to the infant. In the mollusc this simple consciousness never goes further. In the infant it, in time, becomes a reflective consciousness, and a basis for further thought and reasoning. Thus are we, irresistibly, conducted to the conclusion that every living and sentient being is an "ego," each being a distinctive unit, sole and indivisible and apart from every other; and having different positions in the scale of existence assigned to each.

In this consciousness, which goes on with the animated being in an unbroken line of continuity, identity resides, as a living truth. It is inseparably linked to every sensation and every idea perceived by

the mind; and it is a question whether the mind is ever without sensations or ideas. There are occasions when we cannot recall our sensations, so as to be able to aver that such were present; but this, by no means, proves that they were not present. It is remarked by Leibnitz to the utter demolition of Dr. Reid's theory, that our dreams, whilst we are under their influence, are "just as real as our waking experiences." We never doubt their reality, nor do we ever lose the consciousness of our own identity. Hence, we only know them to have been dreams by their inconsistency with what went before and what followed. Thus, I dream that I am in Bohemia, and there pass through some adventures. I awake and find myself in bed, in my own chamber, and my clothes lying, folded up, upon the chairs where I deposited them over night. It is from the inconsistency of these phenomena with the phenomena of the dream that I infer its want of reality. I have no other means of detecting that want of reality. Whilst dreaming, I believed the Bohemian phenomena as firmly as I believe the waking phenomena. But the phenomena of wakefulness are not subject to these inconsistencies; and, hence, I infer that dreaming phenomena are caused by the restless vitality of the mind even during repose, and arise within it instead of being impressed upon it.

Throughout the series of phenomena, incident to the process of dreaming, it is clear the consciousness of our identity, however, remains unbroken. It is *we* who dream this or that; and our personality is the same all through. It is an undecided question whether the mind is ever, under any circumstances, or in any case, destitute of ideas. After excessively sound sleep, and after fainting, it is true there is no remembrance of any ideas having passed through the mind; but this does not prove their absence. Awaking slowly from profound sleep, or struggling out of a swoon, the act of memory is interrupted, and the new sensations obliterate their predecessors. When awakened suddenly and violently, we are always dreaming. Be this as it may, however, the continuity of consciousness remains as before. A suspension of all consciousness would be a blank; and a blank is nothing. But by the interposition of nothing continuity

cannot be broken. It would be as continuous as before; and the word "interposition," so used, is really without meaning.

In fact, if narrowly examined, the question of suspended consciousness will be found to end in merely logomachy, or the bewilderment arising out of the use of indeterminate language, to which no fixed ideas are annexed. We have already seen that nothing can be more uncertain than our measurement of time. Our general notions of time are based upon the rate at which our ideas succeed, or seem to succeed, each other. We guess that an hour has passed, when we apprehend, judging by past experience, that our ideas have been numerous enough to occupy an hour as determined by a time-piece. This mode is, however, uncertain in the extreme. Our ideas may be so rapid as to make a few seconds seem an hour; or we may be so occupied that we omit to note the succession of ideas, in which case an hour may appear to be only a few minutes. It is recorded by a military officer that, after a toilsome march, he always slept profoundly, until roused by the morning-gun. Between his hearing the report and becoming wide awake a few seconds only intervened; yet, during these, he often appeared to dream a long dream. In this case, the rapidity of the succession of ideas must have been wonderful. From this it seems to follow that, in ordinary cases, there must be some intervals between one idea and another; and these intervals must be blank, as far as consciousness is concerned, and consequently are not perceived, and pass for nothing. They do not injure the continuity of our consciousness. Yet they must be real intervals according to our definition of time.

If we take a rapidly striking clock, for example, we shall require twelve strokes to fill up as many seconds, in accordance with the general rate of succession of our ideas. In this case we detect no intervals betwixt stroke and stroke. But were our succession of ideas suddenly quickened until it reached the rapidity of that described by the officer, the intervals would become very apparent, and we should be compelled to seek for ideas to supply the gaps. It follows that in all cases, as far as we know, there must be unconscious intervals between each of our ideas and those before and after; but they are not noted, and the continuity is not broken.

There is another fallacy as to identity, very common, but which is, yet, destitute of any foundation in truth or fact. It is hastily assumed by some that, because madmen frequently labour under delusions as to who they are, the consciousness of identity is, in their case, destroyed. This I believe to be a great error, arising out of a want of precision of language. John Doe, for instance, "labours under a delusion as to who he is." This is the phrase usually employed. If we examine the matter narrowly, however, we find that John Doe is not under any delusion as to identity. He refuses, to be sure, to respond when addressed as John Doe; and if asked why, he replies that the address is improper, inasmuch as he is Archbishop of Canterbury, and not John Doe, the costermonger. Here, however, is no delusion as to identity. He is quite conscious that he is the identical person whom the world mistakenly supposes to be a costermonger, named John Doe; and his delusion is in his persuasion that the world, all this while, has been attributing to him a wrong position. The supposed John Doe he admits to be personally identical with the real Archbishop of Canterbury; and the delusion does not relate at all to persons but as to positions in society. He insists that he is archbishop. The world insists that he is a costermonger; and society, being the strongest, sends him to an asylum for assuming a dignity that he is convinced belongs to him. This is the sole bone of contention between John and his doctors; but as to his identity, as a man, he is as clear as they are.

We might, indeed, go further than this. There are numerous instances on record in which insane persons were under a delusion as to their sex as well as their social position. Even this, however, does not involve any defective idea of identity in such persons, extraordinary as the fancy may appear. John Doe imagines himself to be Queen of Bohemia, other people insist upon it that he is a man and a costermonger. All this time he knows himself to be identical with the person they call John Doe, the costermonger; but he persists in thinking everybody mistaken, both as to his position and sex. He is a queen and a woman in his own estimation.

LETTER XIII.


HABIT.

HABIT may be defined as a tendency in individuals to perform some act at some particular time, under such circumstances as to render the doing so peculiar to the individual. And it may also be further defined as an association of ideas, so uncommon as to be an insulated case, both in occurrence and results. Under both these definitions, however, we must refer habit to the mind, and treat it as a certain and given condition of mind. And this we must do, whether we treat of the habits of human beings or of the lower animals: for that animals are capable of habits peculiar to the individual, will not, I think, be denied by those who have observed their acts narrowly. That the major portion of those actions that are attributed to habit, are, however, referable to mind will, I think, on investigation, be found to be so.

It is, for instance, not uncommonly attributed to individuals that, when in deep thought, they are in the habit of biting their nails. This is, no doubt, generally speaking, attributed correctly in each case. The matter to be explained is how has it arisen? Probably from the desire to relieve, by means of some act, too trifling to act as an interruption, the monotony of dwelling long and continuously upon one sole subject: a labour of mind highly irksome to the great majority of mankind; and one to which few indeed can submit for any length of time. Sir Isaac Newton gave it as his opinion that he was only superior to those about him from the circumstance of his possessing this rare capability of dwelling, at a length almost interminable, upon one question until, at last, he solved it. Another man, he affirmed, would have arrived at the solution, could he have persevered as long. It is from the same wish to relieve, by a slight

exercise, the wearisome monotony and painful effort of intense thought in one direction, that causes in many men, the habit of walking backwards and forwards, on occasions where deep reflection is demanded. The act of walking ameliorates the monotony, and relieves, somewhat, the effort to fix attention to one sole point, to the exclusion of all others. These are manifestly habitual acts arising out of a certain state of mind, and are never entirely mechanical. There are, however, other actions that become, by repetition, so apparently mechanical that they can hardly be connected with any distinct mental act, although, at first, they may have been certainly referable to distinct exertions of the will. Amongst these we may class the movements of the hands and fingers made by persons skilled in the use of musical instruments. These appear, at last, to become entirely mechanical. A good musician, for instance, will sing, to some known air, a song which he never saw before, reading it from a book as he sings; and he will, at the same time, accompany himself on the piano-forte, giving all his attention, apparently, to the words of the song, and playing the accompaniment quite mechanically. Still this is, in point of fact, referable to the mind. When the musician first learned to touch the particular notes forming the accompaniment, he only effected this by distinct acts of the will, which directed each separate action of hand and finger. As he became more and more expert, the acts followed the will more and more rapidly, until the distinct acts became so closely associated together in the mind, in the order in which they were to be played, that the sequence became at last too rapid to be noted mentally, and the whole becomes mechanical in appearance. It is hardly possible, however, to doubt that the player, whilst performing, has a full idea of that which he plays, though enabled to divide his attention so far as to allow him to read whilst he plays.

That the mind can thus divide itself, and attend to two or more objects at one and the same time, as far as can be noted, is an undoubted though somewhat extraordinary fact. A musician, for instance, attends to the bass and to the treble part at one and the same time, as far as we can judge. But this, at first, was not so. When learning music, he learned to play treble and bass separately before



playing them together : and the act of joining them, and playing one with each hand, required, at first, distinct acts of the will. In like manner, there are persons who can add up, at one and the same time, as far as can be judged, the pence and shillings of a long sum of compound addition, and carry the amount of pounds correctly to the last line, leaving the odd shillings and pence, if any, correctly, also. This, however, is only a habit, or mental act, acquired after many trials, long practice, and much perseverance. Before the two lines were summed up simultaneously, they must, often and often, have been so separately, until the act of rapid addition enabled the mind to divide its attention between the two. Thus then, in these cases, the habit is not only a mental habit, but one voluntarily sought, and acquired by an effort of the will.

This, however, is only true of certain habits. There are others with which the will cannot have had anything to do, and which, therefore, must have been acquired, in some sort, mechanically, or at all events, involuntarily. Mr. Locke relates, somewhere, the case of a young man who had been taught to dance after he arrived at manhood, and who happened to practice in a room where stood a large oaken chest. By some strange chance or other, he, without noticing the fact or its probable consequences, gradually came to associate the figure of the dance he was performing with the box which stood against the wall of the apartment. This probably arose from a deficiency of partners to make up the figure. Be this as it might, however, so strongly did the box, at last, become associated with the figures of the dances taught the young man, that, when he tried to dance in another apartment, he was immediately at fault, owing to the absence of the box. It is manifest that with this odd habit the will had nothing to do. It must have crept upon him, and fixed itself upon him, without his being aware of what was going on ; yet it was, nevertheless, a mental habit, and it is to be referred entirely to mind, though not to any deliberate act of the will.

Akin to this, is the habit that besets some inveterate story-tellers of relating the same stories over and over again, and in precisely the same order, as well as in very nearly the same words. It is unquestionable that some persons have, to a most remarkable extent, been

enslaved by this practice; especially persons of high rank in society, who are less liable to be corrected by those with whom they mix. It is related of a nobleman, who had become gradually addicted to this thoughtless procedure, that seeing one of his guests asleep, he accused him of this lapse of good manners; when the other boldly denied the charge, and jocularly offered to bet a wager that he could prove he was awake. The bet was accepted; when the culprit very coolly repeated the point of story which his lordship was telling when he was accused of slumbering. This proof of wakefulness was accepted by the whole company, my lord included, as being quite decisive of the truth; when, to the amusement of everybody, the impudent wag added—after all, the fact is I *was* asleep: but, when I awoke, I looked at my watch, and I knew your lordship would tell that story precisely at that hour!

Here we have a habit so settled and inveterate as to include exactitude of time together with the other circumstances, yet its origin was, no doubt, mental at first, although mechanical at last, as the motions of the clock itself. The order in which the stories succeeded each other must, at first, have been the effect of preference; and the mode of relation the same. The habitual mechanism was undoubtedly the fruit of long and frequent repetition, until the process and its results became irresistible by gradually ceasing to be resisted.

In all these cases, the habit may be clearly traced to the mind, and be proved to be mental in origin, in nature, and in growth. There are, however, other cases, much more full of difficulty, in which the habit seems not only to be independent of, but even antagonistic to the mind; and necessarily to lead to inferences of a somewhat puzzling description, if we are to assume the material theory as admitted or proved. As to the reality of the asserted facts there cannot be a doubt; and if they are not to be accounted for in one way they must be capable of being so in some other way.

There is no doubt that certain individuals who have, for long periods, being subject to habitual inconveniences such as cold feet, rheumatic or gouty pains in the legs, arms, or hands, and aching of the bones, continue, after being deprived of one or more of their limbs, to undergo the same inconveniences as before. The seaman

who has lost both legs in action, still feels his feet ache with cold and his legs tortured by rheumatic pains. His comrade, who has lost an arm, is no better off. Rheumatic cramps still frequent the fingers of the vanished limb; or the dregs of bye-gone fevers still plant the unseen arm with twinges that course from wrist to shoulder.

Nelson, somewhere in his correspondence, tells one of his friends of his still feeling in his lost arm the aches and twinges, that a residence on the West India station, and the fever, incident to new comers, caused him to suffer, occasionally, in his limbs ever after. On this fact he founds an argument that all our impressions must be ultimately referred to the mental principle, and that man is really, in essence, immaterial and immortal. With this argument of Nelson certain critics, in my notion more superficial than wise and more flippant than profound, have made themselves unnecessarily merry, and very foolishly jocose. The great admiral and sailor was not out in his reckoning, albeit more of a seaman than a metaphysician. The acute and vigorous intellect of Nelson, no doubt, perceived that although, as far as tangible and visible impressions were in question, his arm had vanished, yet as far as painful impressions were concerned, it was still there. Hence, he concluded that our impressions of our own limbs and bodies exist only in our minds, and that some may cease and determine whilst others remain. From this he inferred that all must be, ultimately and in the last resort, referred to spirit, which is alone capable of receiving and retaining sensible impressions, and which being of the same substance with the great Spirit cannot die nor suffer decay.

It is not necessary to suppose that Lord Nelson carried out his argument in all its collateral bearings, or that he was even competent to such a task. His very different avocations and studies must have tended to leave him a mere tyro in this species of argumentation. If asked how he would suppose the mind not subject to decay, seeing that many persons, in age, become mentally imbecile? he probably would not have thought of replying with another question, why is the human mind, in the morning, more clear, and more capable of active and strong exertion, than it is after it has received all the impressions of a long day? This question he would not have put to

his questioner, because he was probably unaware that one reply answered both ; that is to say, because the power of attention suffers from repetition and the multiplication of objects ; and, hence, impressions and ideas become less and less vivid, and the power of reflection and combination less active, and less successful as time goes on. From this and many other similar cases, however, it becomes sufficiently manifest that these habitual pains have their seat really in the mind, and that, if they be properly "habits," they are mental, and not bodily, in location and nature, and ought so to be held.

Thus far the habits which we have been considering seem to reside in and be attributable to the mind ; but there are others, which are more emphatically bodily habits, which we can hardly attribute to the mind, because they often seem to be antagonistic, and are most difficult to be explained upon any theory whatsoever.

There are instances of persons who have, throughout a series of years, been induced, by considerations of business to dine at one certain hour ; say five p.m. Until the hour of five is at hand, such persons are without any sense of hunger. When five, however, is reached, let their attention be ever so deeply engaged, it matters not, the craving of hunger arises immediately, and the stomach seems to recall the mind to the fact, and to remind it that the hour for eating has arrived and must be so employed. Some will explain this by saying that the stomach, being now empty to a certain extent, a feeling of uneasiness naturally follows if this emptiness is pushed to an unusual extent. This explanation does not, however, meet the whole case. For even if such person, by chance, anticipate his wonted hour of dining, and partake of an earlier meal, the same phenomenon occurs. At five o'clock the desire for food returns, although the food has been taken at an earlier hour. How is this to be explained ? The reason already adduced does not meet the case.

There is no unusual emptiness to cause uneasiness ; and the attention is engaged in another totally different direction. To say the stomach is habituated to food at this hour, is to say that a congeries of inanimate atoms, having no assignable qualities but solidity, shape, colour, and power of cohesion, are capable of a mental function, which is inconceivable by any effort of imagination. We might as well say

of a stone, that rolls down a hill, that it has a "habit" of rolling down hills, as say of a parcel of atoms, that they have a "habit" of craving for food at a certain hour. One expression is just as absurd as the other: yet many persons will make use of the last, and think it an explanation, without the slightest idea of absurdity being involved in the second phrase just as certainly as in the first.

There are other cases, equally inexplicable upon the atomic theory. For example, it is well known that persons who have been accustomed to relieve the urinary reservoir at given times, be their attention ever so engaged with other business, are yet visited, at the exact hour, by an invincible and uncontrollable call to obey this their habit. Nor can this be explained by a reference to quantity, or the comparative fullness of the urinary reservoir: because, though the call may have been met by anticipation a quarter of an hour before, it returns in full force at the customary hour, however unexpected or unthought of. How, then, is this to be explained? These material organs are a mere combination of atoms of "brute matter," yet they are apparently capable of habit, which is a mental quality, and cannot be conceived to exist in atoms of mere "brute matter," as it is termed. Upon any theory of matter, atomic or not, this undoubted fact appears inexplicable; yet, so it must apparently remain, until some theory, not material, be wrought out and adopted.

I may mention, in conclusion, that the lower animals, dogs for example, are capable of being taught habits. Dr. Southey, I think, in his "Omniana," relates that a dog, which had been the property of a Catholic, was made by his master to fast on Fridays. He afterwards changed masters, but never would be brought to discontinue his Friday's fasts, but resolutely refused the food offered. To do this, he must have been not only capable of habit, but able, in some way, to count the days from Friday to Friday. I could adduce from my own knowledge, other curious instances, not only of habit, but of reasoning and scheming, exhibited by the canine race; but I hasten to conclude this letter. The probable truth is, that all habits originate in voluntary acts, which, by repetition, become, in all appearance, mechanical; as does playing upon a musical instrument.

LETTER XIV.

DOMINION OF MIND OVER MATTER.

THE domination of mind over body is, I believe, admitted by all who assume that man is composed of two principles—an immaterial principle, capable of sensation, passion, and reflection; and a material or bodily principle, composed of material atoms, and capable of being decomposed and resolved back again into these original atoms. The apparent instances of this power of mind over body are far too many to admit of any denial of the phenomena. The difficulty of the various cases and examples resides in the explanation of phenomena, in many instances, apparently inexplicable. I shall, first, state some extraordinary, but undeniable, instances of the powerful influence which mind has upon not only bodily functions, but upon body itself. Having done this, I shall attempt to show that the phenomena are not susceptible of explanation upon the principles of materialism, but are more puzzling and more impossible to be conceived than are various chemical phenomena, which I have already adduced and considered.

In the first place, I may mention that the instances which prove the great influence of the passion of fear upon the human frame are innumerable. It is a known and admitted fact, that the dread of death, and the horror consequent upon the certainty of a public execution, have changed the hair of young persons to grey, or absolute white, in the course of not any great number of hours. This was the case with the unfortunate, and much to be pitied, Marie Antoinette, Queen of Louis the Sixteenth, whose hair became nearly white in the course of a few hours, after she was condemned to die by the guillotine. A similar extraordinary change is recorded to have taken place in the hair of many other persons of both sexes, similarly circumstanced.

That the fear of death may be so powerful in its effects on bodily function as actually to produce that fatal result, seems, also, to be all but certain. It is on record that a malefactor, sentenced to death by decapitation, on being brought to the scaffold, was carefully blindfolded, and, then, made to lay his head upon the block. Instead of a blow with the axe, however, a dish of cold water was dashed upon his neck; but the effect of the shock was fatal. The nervous system seems to have been at once destroyed, and the culprit to have died of sudden nervous atrophy, the consequence of intense fear.

There is another instance related of a person, condemned to death, who was made to believe he was to have his veins opened. He was then blindfolded and put into a warm bath, and his wrists being slightly scratched by a lancet, a small, trickling, stream of warm water was kept up, to represent to his imagination a gradual loss of blood. The effect was extraordinary. The man became deathly pale; the motion of the heart grew less and less; faintness followed; the pulse became nearly extinct; and the man would, to all appearance, have died from the imagination of dying, had the experiment been carried further.

To the same effect is the story told of a young German student at one of the Universities—Gottingen, I think—who, no doubt, under the influence of disease or oppression of the brain, had imagined that a spectre appeared to him and foretold his death, on a certain day, and at a certain hour. So powerful was the illusion, that he could not be persuaded that it was unreal; and when the time announced by the imaginary visitant drew near, he became exceedingly ill. Medical assistance he had of the best description; but medicine ceased to be of any avail. Stimulants were powerless to rouse him; everything that science could suggest was tried, but in vain; and he seemed to be rapidly sinking, when, luckily, as a last resource, a strong soporific was administered. It took effect, and he fell into a profound sleep, which was prolonged much beyond the hour which he was persuaded must be fatal to him. On awaking, and finding that such was the truth, the entire illusion vanished at once. He became a new man, and in a few days, recovered his wonted health.

and strength. He was of a nervous and highly sensitive temperament, but never experienced any further attack from this strange malady.

In these cases, the domination of the mental over the physical powers are involuntary; for fear is quite involuntary. There appears, however, to be cases in which the will is employed to control the bodily phenomena, in a manner that may, with propriety, be designated as most extraordinary and most inexplicable. The celebrated physician Dr. Cheynè, in one of his works, relates with much detail, the extraordinary case of an elderly military gentleman, his patient. This gentleman had laboured, for a long time, under a lingering disorder, which was attended with much nervous prostration and severe depression of the nervous system. Before Dr. Cheynè was called in, he had been attended by a surgeon of eminence, and by an apothecary who compounded the medicines administered.

During a conversation with his patient the doctor was astonished to learn from him that, by an effort of his will, he could to all appearance die, and after a time recover from this death-like state to the use of his faculties and senses. He offered to fix a day for Dr. Cheynè to witness this strange fact, in company with the two other medical men. At the time fixed all three were in attendance; and they found their patient in bed, and in his usual health in every respect, as to which they fully satisfied themselves. After seating themselves at the sides of the bed, the patient composed himself in a reclining posture upon his pillows. Dr. Cheynè felt his pulse at the wrist. The surgeon had his hand upon the region of the heart; and the apothecary, Mr. Skrine, held a mirror near his lips, by means of which the slightest breathing could be detected. After a short time the pulse sunk and became quite imperceptible. The motion of the heart ceased entirely; nor could the faintest breathing be detected by means of the mirror, nor by any other method. In short, the patient was, to all appearance, dead, and would have been so pronounced by any medical practitioner.

In this state the gentleman lay for the best part of an hour, and until the three witnesses became seriously alarmed. They thought

that this strange experiment had been carried too far, and that death had actually ensued. Under this impression they called in their patient's usual attendants, and were preparing, much shocked by that which had occurred, to leave the house, when one of the party observed a faint motion of the chest of the seemingly deceased gentleman. This was soon followed by other symptoms of returning life; and, after a time, the subject of this extraordinary experiment sat up and discoursed, as usual, with his professional advisers, who departed, not a little amazed by what they had witnessed. I ought to add that the gentleman in question lingered a few months, and then died, apparently under total nervous exhaustion.

In this unique case, as to the facts of which there cannot exist a shadow of doubt, we have a mere exertion of the will controlling every bodily function. By an act of volition the motion of the heart, the action of the lungs, the circulation of the blood, and all its attendant pulsations, are arrested and all but extinguished; and by another act of volition all this complex machinery, as it is termed, is again set in motion, and made to perform and discharge its wonted functions. Whether the patient preserved his consciousness throughout the entire process, or was for a time only half-conscious, is not precisely stated; but I infer from the circumstances that he was conscious, more or less, all through. It was not fainting, in the common meaning of the term, but a state of bodily collapse, brought about and caused, and then cured by the power of the will exerted upon that body, however composed.

That by a mere exertion of his will a man should be able to die and then return to life, is sufficiently inexplicable; but there are recorded and attested facts which go beyond this, and prove that mental emotions may change the absolute nature of material substances connected with the human frame, and forming important portions of it.

It is well known that a mixture of saliva with our food is requisite to digestion; and, hence, during the act of eating an additional flow of saliva is brought about, in order to insure complete digestion; but to this power of an increased secretion of saliva the actual

presence of food is not necessary. The mind can act upon and give added power to the salivary glands without the aid or presence of food. Thus, it is commonly observed that, when we become hungry, the very idea of some savoury or accustomed food of any sort is sufficient to create an additional flow of saliva. Hence comes the vulgar expression that the mention of savoury food, or favourite food of any kind, "makes the mouth water;" or, in other words, stimulates into strong action the salivary gland.

It is no uncommon case with persons afflicted with toothache to find the pain of an attack suddenly quelled by some news, or some incident of an exciting nature; and most persons who have had teeth drawn have learned, by experience, that the very presence of the dentist, and the sight of his instruments, can quench the agony for the moment, which at once, however, returns, if the patient quits the dentist without allowing him to proceed to the extraction of the tooth, which is sometimes the case with timid natures. Through the operation of a similar cause, an obstinate hiccup may frequently be cured by saying something calculated to alarm the sufferer, and violently draw the attention from the immediate malady. The many apparent cures of various diseases which have undoubtedly been wrought by the touch of relics amongst religious enthusiasts and other credulous votaries of tombs of saints, shrines, holy oil, and other charms of this description, bear witness to the fact of the mind's dominion over the body. It is true that in many instances the disease returns after the excitement has grown less through the operation of time; but this only proves that it had not been strong enough to completely cure the ailment, although it was potent enough to arrest it for a certain period.

Grief and excessive agitation will, in some cases, produce immediate change of bodily function. Thus, it is asserted, in the *Encyclopædia of Anatomy*, "that the halitus of the lungs is in some persons affected by mental emotions so much that a piece of bad news shall instantaneously produce a fetid breath."

This is puzzling enough if we are to try to explain it upon the principles assumed by the materialist, which teach us that the stomach

is composed of atoms of matter having certain definite qualities, and that food is similarly composed. Fetid breath is almost invariably caused by food being introduced into the stomach which it cannot digest healthily, and which, by the interruption so caused in the process and the imperfect digestion produced, causes fumes to mingle with the breath, which, with a perfect digestion, would not have been let loose. The puzzle is to conceive how an effect, produced upon an immaterial substance, or existence, such as is the mind, should effect a change either in the food or in the stomach, or in both, so as to make food, which would otherwise have been digestible and wholesome, unwholesome and indigestible.

In the same work, the *Encyclopædia of Anatomy*, we find recorded still more extraordinary instances of the dominion of mind over matter. That mind should have power to turn wholesome into unwholesome food, or instantaneously change a strong stomach into a debilitated one, is passing strange. But more wonderful effects than these are there recorded. In its pages we shall find written the fact that a mere emotion of the mind can cause an eminently nourishing fluid to be transmuted into a deadly poison; and that which was intended for the sustenance of the babe to become the instrument of its destruction. I extract the following details from the fourth volume of the *Encyclopædia of Anatomy*, p. 465, department "Secretion."

"A carpenter quarrelled with a soldier billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter, at first, trembled with fear and terror; and then, suddenly, threw herself, furiously, between the combatants; wrenched the sword from the soldier's hand, and broke it in pieces, and then threw it away. During the tumult some neighbours came in and separated the men. Whilst in a state of strong excitement the mother took up her child from the cradle, where it lay, playing, in the most perfect health, never having had a moment's illness. She gave it the breast, and in so doing sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and sunk dead upon the mother's bosom. A physician found the child lying as if asleep, its features undisturbed, but all his services were fruitless. It was irretrievably gone!

Another instance is quoted by the *Encyclopædia of Anatomy* from the *Lancet*, No. 516. "Mr. Wardrop mentions that having removed a small tumour from behind the ear of a mother, all went well until she fell into a violent passion, when, having suckled her child, it soon afterwards died in violent convulsions. Mr. Wardrop was sent for, soon after this, to see a child in convulsions after taking the breast of a nurse who had been seriously reprimanded: and he was informed, by Sir Richard Croft, that he had seen several similar instances."

Another example I quote from the *Encyclopædia of Anatomy*, vol. iv. This is the statement. "Burdack relates two cases of a similar kind. In one, the mother, having received some very alarming intelligence, put her infant to suck, when it died before the eyes of the messenger. In the second, the child being nursed when the mother was in a state of violent agitation, it suddenly became pale, and was paralyzed on one side and convulsed on the other. A similar case is recorded in Casper's *Wechenschieft*, 1845, s. 204. A woman giving suck became violently excited by the theft of some article of value. The child sucking during this violent agitation, at first rejected the milk, but subsequently took a quantity. Violent vomiting supervened. In the course of a few hours the child took the other breast, when it was seized with convulsions and died, in spite of all medical aid."

From the same work, the *Encyclopædia of Anatomy*, vol. iv., p. 466, I extract the following familiar, but very curious, instance of the domination over, so-called, bodily function exercised by the mind. It appears to be a sort of ordeal, common in India, and common, doubtless, because successful. "The flow of saliva is augmented by the sight, smell, taste, and even idea of food; whilst it is arrested by strong emotion; as is shown by the well-known test, often resorted to in India, for the discovery of a thief amongst the servants of a family. All the parties being condemned to hold a certain quantity of rice in the mouth during a few minutes, the offender is distinguished by the comparative dryness of his mouthful at the end of the experiment."

There is another class of instances, less certainly established I admit, of this strange influence of mind over body, from which it would be easy to adduce curious examples of this most extraordinary power. I allude to the marks alleged to be made on infants, whilst still in the womb, in consequence of accidents, though not of a serious sort, happening the mother. I am quite aware that there are persons, intellectually well qualified to judge of such alleged facts, who are sceptical as to this matter. Such reasoners assert that the believers in such alleged consequences jump to a conclusion which is not warranted. That, in the alleged instances, the supposed cause is mostly discovered after the alleged effect has become visible on the birth of the child; and that, finally, the whole is inference, rashly adopted, without reliable direct evidence. These objections are, by no means, destitute of weight: and had the alleged facts in question been more extraordinary than others universally admitted, they might have been deemed sufficient to induce a suspension of our belief in this case. But no one doubts the fact of family-likenesses: yet the transmission to the child of the family-likeness is just as difficult to be imagined as is the transmission to children of marks, the consequences of impressions suddenly made upon the mothers.

In short, upon the theory of matter being merely a congeries of atoms, having certain definite, inherent qualities, the facts, here detailed, are not only impossible to be explained, but even to be conceived to occur. No effort of the fancy can picture any *modus operandi*. The mind is admitted, on all hands, to be immaterial. No one, now a days, will gravely argue that thought can be spun by means of machinery, like cotton by a spinning-jenny; or secreted from the pulpy part of the brain, as saliva is by the salivary gland. Thought and sensation are the attributes, then, of substance, having no one quality or property in common with matter so-called, and as defined. How, then, can mind act upon matter, or matter be acted upon by mind? We have evidence undeniable that by a strong mental excitement, the highly nutritious assemblage of particles that go to compose human milk, may be, at once, transmuted into poison, and made to kill the infant they were meant to nourish. By what

conceivable means, assuming matter to be as it is defined, can this be accomplished? Are the milky particles re-created and new and opposite qualities assigned them? or are poisonous particles added to the nutritive particles enough to overpower them? If so, whence are they derived, or what seizes hold of and brings them? Can the mind seize an atom, make it prisoner, and force it amongst other atoms of a better sort, to produce an effect not contemplated by the agent producing the mischief? Can human ingenuity conceive and explain how a process, like this, is to be carried out? The case of the German student is equally mysterious. How is a mental impression to destroy the action of nutritive food; to neutralize the power of stimulant cordials; to arrest the circulation of the blood; to extinguish the nervous energy; and bring a man to the verge of death, without any natural cause for his dying being present? It is easy to ask these questions. The difficulty is to find an answer that shall bear the semblance of common sense or actual meaning.

LETTER XV.

WHAT IS THE USE OF MATTER ?


IN the course of the preceding letters we have reviewed the principal difficulties that are involved in the assumption of material existence. They are manifold. We have seen that thought cannot be conceived to be the product of any combination of atoms, or any material machinery whatsoever. No power of imagination can conceive this, much less can any ingenuity prove it. To account for our own being we are, therefore, driven, perforce, to admit the existence of mind or spirit. But this admission, at once, involves another difficulty quite insurmountable. If that which we call our body positively and really exist, then all the phenomena prove that mind acts upon it. This the undeniable facts, detailed in the preceding letters, fully demonstrate. Thus we are immediately brought face to face with a plain contradiction. Spirit or mind has no quality in common with matter. But, for substances to act and re-act upon each other, they must have some quality, or qualities, in common. If, therefore, we will dogmatically assert that matter, as defined, really and positively exists, we must admit a contradiction to be true, and thus cut away, at a blow, the foundation of all reasoning. If one contradiction is admitted, all others must, and ratiocination is brought to a dead lock. Reason cannot move a step further; she is struck with paralysis, and so expires.

Thus, then, we are driven, as it were, perforce to seek a means of escape. Is any road open through which we may escape from a position so cruelly embarrassing? There is such a road; and we find it when we ask ourselves the plain question—What is the use of asserting this dogma of the actual existence of matter? This dogma—for it is nothing better—has been obstinately adhered to for

centuries; yet, what good has come of this dogged adherence? I am, of course, aware that the answer is ready—cut and dried. The constant reply is the sensible qualities of matter are perceived by everybody, and they must, of necessity, inhere in something, and that something is matter; and this has, hitherto, passed for an answer. I cannot admit it to be one.

What are the sensible qualities of matter, I enquire? Colour, shape, solidity, attraction, repulsion, smell, taste, mobility. These are said to be the sensible qualities of matter. Said to be so. But why said? On what foundation of proof?

It has been the aim and object of the foregoing letters to enquire into the true nature of these so-called “sensible qualities of matter,” and we have found that they all resolve themselves into impressions made upon our minds. If we push the enquiry a step further, and ask what it is that makes these impressions, or how come they to be made, is there any possible answer save one? The common answer is, doubtless, when this question is ventured upon—Why, by the things themselves—by the material substances which we see and touch. To this answer I reply, how do you know this? You deal with it as if it were a matter of course; but how come you to be so sure of this? We have already seen that the phenomena which you call “the sensible qualities of matter” are merely impressions made upon the mind. May not these impressions be made by some means still unknown to you? The possibility of this being so cannot be denied. They may be the direct act of the Deity; or they may be brought about by the Creator, through some intermediate means, not material. Why is this assertion less likely than the dogma that our impressions are the effects of material existences apart from, and distinct from, ourselves? We have already seen that the mere assumption of material existence involves us in endless contradictions. Why, then, assume it, as if it were a matter of necessity to do so? Why dogmatize upon the subject? If we are to assume the existence of matter, as defined, at all hazards, we ought to be able to demonstrate its utility. Can we do this? Can we satisfactorily answer the question, “What is the use of matter?”



If material substance, as defined, be of any utility at all, it can only be so in one or more of the three following modes :—It must be of use to itself. It must be of use to something else. Or, it must be of use both to itself and to something else. No fourth mode is conceivable. In the replies given to these three questions—Is it of use to itself? or to something else? or both to itself and to something else? must the proof of the utility of matter (assuming it to exist) be found. Let us consider them one by one.

First, then, is material substance of any use to itself?

Before proceeding to reply to this question, it will be necessary that a precise definition of the meaning of the word “use,” as here employed, should be given. This, therefore, I proceed to do. For anything to be “useful,” in the proper meaning of the term, I contend it must either supply a want, or impart, or, in some way, bestow a pleasure. When not applied in this sense, as is frequently the case, it seems to me to be incorrectly employed. It is, I am well aware, very common to say that one thing is “of use” to another, which other is incapable of either feeling a want or enjoying a pleasure. For instance, it is usual to say the foundation is “of use” to the house; which, otherwise, could not stand. This, however, appears to me to be, clearly, an incorrect phrase. It applies to the house that which is only applicable to the owner of the house. If the foundation give way, the injury is to the owner, really, and not the building—for if both foundation and building were to cease to exist, it would not, in any intelligible sense, be an injury to either. We do not *outrage* a house by pulling it down; although we may possibly, by the act, commit an outrage on the owner. I, therefore, employ the terms “use” and “useful” as before defined, and only as so defined.


In this definition, if accepted, as I think it must be, we find an answer to the first of these questions. How can a congeries of atoms, having only the qualities of extension, solidity, shape, and colour, be of use to another collection of similar atoms? Neither are capable either of perceiving a want or receiving a pleasure; and, hence, the term “use” is not applicable to either. If then material substance is of any use, it must be of use to something else. Its existence must

be proved either to be necessary or else expedient in order to supply some want or confer some pleasure, or benefit, upon something else. What is that something else?

If matter can be shown to be useful to something else, that something must be not material, but some living being, or beings, capable of sensation, perception, memory, thought, or reflection, or some, or all of them, combined. In short, if material substance is to be demonstrated to be useful to something other than itself, it must be so to man or to the lower animals, or to both, as living, percipient beings, capable of receiving sensations of pleasure or pain, and of remembering and recalling, and reasoning upon them, within certain limits, more or less extended. As to this portion of the question there is little room for hesitation surely. If material substance cannot be of use to material substance, then, if of use at all, it must be to something immaterial. Let us begin with man, a being agreed on all hands to be endowed with an immortal spirit. Let us enquire of what use material substance is to him?

Before we can answer this question, it is clearly requisite that we should first ask, and also reply to, another. Before we can answer the enquiry as to what is the use of material substance to the human being, we must, first, try to ascertain the reason of the human being being placed where he is. For it is manifest that, unless we know the use, or uses, to man, himself, of his own existence here, it is impossible we should solve the question—how far does material existence contribute to these uses? To that, then, let us first address ourselves. What are the uses to man, himself, of his present existence? Of what nature are these uses, or this use? Are they referable to the material frame or the immaterial spirit of man; assuming that man's nature is twofold? Taking it for granted, for the sake of the argument that man is composed of body and soul conjoined, according to the materialist's doctrine, as held by theologians and by philosophers generally, as well as by the vulgar, how is this to be answered?

If this question be put to students of theology we shall find them reply, for the most part, that man, in this world, is "in a state of trial." This, at all events, is the answer of those who hold to the doctrine of "free-will," as opposed to the doctrine known as "philosophical



necessity." If we put the same question to students of moral philosophy and psychology, and to those theologians who hold that the will is necessarily determined by the strongest motive, we shall, for the most part, be answered that "man's life is a course of discipline," the effects of which are various. The result is that we discover a certain amount of ambiguity in both replies. The word "trial" is objectionable to those who maintain the "necessity of human actions." The word "discipline" is objectionable to those who hold to the doctrine of "freedom" of the human will. It is fortunate that between these two the writer of these letters is not bound to decide. It is sufficient for his purpose that both agree in one particular. By the word "trial" and the word "discipline" both mean an effect to be produced upon the mind. This effect, no doubt, they will tell us is very often, nay mostly, produced through the medium of the body; but, if fixed to the point, both will admit that the effect is ultimately upon the mind, or soul, and that it is the soul that is "tried," or "disciplined," and not the body.

Here, then, we arrive at another stage of the argument. If we still continue to admit, for the argument's sake, that man is of the twofold nature which the theory of materialism assumes as a fact, we may, also, safely admit that the discipline or probation to which the mind is subjected, during this stage of existence, is, in a great measure, brought about by the impressions and sensations known as bodily sensations or as passions. This, a little reflection will convince us, is true, beyond all doubt or denial. In short it needs only a little calm and patient investigation to see, very clearly, that the bodily wants of mankind are really the foundation of the complicated arrangement which is known as civilized society, or the body-politic. On a first view the assertion may appear to be startling: but a rigid analysis of that which is termed "a civilized state" will demonstrate its general truth. For if we begin with the legal authority vested in that which we call government, and pass in review all that exists in a civilized and well-governed state, we shall find nearly the whole of it to originate in a few corporeal wants of the animal man, comprised, at first, within a very narrow compass.

The progress of the whole may be traced with tolerable brevity.

Man's primary wants are food (meat and drink); shelter (a dwelling and clothing); a female companion or more than one; to which may be added fire, there being no known people who are unacquainted with the use of fire. In the earliest stage of society men live by hunting; and wild animals, with such fruits as grow spontaneously, form their food. In this stage the hunting grounds are the common property of the tribe, and the soil remains undivided and is left to nature. Yet, in this early stage, the idea of property and its rights is acquired. The produce of the chase is to be equitably divided amongst the little community. Each man has a property, of the personal sort, in his wigwam, his weapons for hunting and defence, in his dress and ornaments, and in his squaw and her children. This gives rise to a simple code of unwritten law, which is administered by the chiefs in council. The chiefs, themselves, are generally elective; and hence, the first shoots of state policy spring. The accidents of the chase and exposure to weather cause wounds and diseases. Hence comes a simple method of surgery and medicine, including a few remedies, and a medicine man to prescribe and administer them. Some hunting-days are luckier than others. This is attributed to the Great Spirit. He is, therefore, to be consulted and propitiated; and hence the rudiments of a priesthood. Lastly, tribes unite for mutual defence; or they quarrel and make war for a time; peace is again made: and hence comes treaties, declarations of war, and the conditions of restored peace, all unwritten, but all formal, binding, and sanctified by ceremonies and ratifications.

The next stage is that in which, hunting being abandoned, the grazing of cattle is substituted. This mode of life is at first nomadic. The tribe, with its cattle, shifts from pasture to pasture, as necessity compels. Tents, or rude huts, form the dwellings; and the only personal property resides in the cattle, as claimed by their several owners, in a few simple utensils and bedding, and in weapons for defence. In this stage the land remains common to the tribe, and is undivided. Property remains personal. Law remains simple. Medicine deals with the few diseases of men and cattle, all living in the open air. Religion is confined chiefly to praying the great spirit

to send sun and rain in their seasons, and to protect the weaker against the rapacity of the stronger tribes. The ideas of a future state remain simple and undefined; and they think to propitiate heaven by the sacrifice of that which is their staff of life, oxen, and sheep or goats.

The next stage is that of cultivation. Pasturage becomes narrowed, and cattle limited in numbers. Vegetables must then form part of the food; and vegetable aliment can only be had in plenty, and with certainty, by means of cultivation and planting. The plough, the spade, the pruning-knife, and the sickle become necessary. The land becomes divided, in accordance with the power of cultivation possessed by the individual. Dwellings become fixed. Clothing, instead of hides of animals, employs the loom. Labour immediately becomes divided. Property, with labour, becomes more and more diversified. With variety of property comes complexity of law; property is divided into real and personal. Buying and selling now becomes a necessary usage of society. With trade comes money and its uses; and bargain and sale still further complicate the law. Out of complex law, and the division of labour, and the usages of money and of bargain and sale, at once arises the absolute necessity of a settled government and a legislature, to fix, regulate, and administer the law. Law thus becomes a profession, and so does statesmanship. As labour and property become more and more divided and subdivided men become congregated in villages and towns for the sake of convenience and security. In the towns want of ventilation and sewers produce new forms of disease, to which the necessity of using salted provisions adds, and medicine and surgery become professions. As civilization and the amalgamation of large communities out of smaller states goes on, the proximity of powerful neighbours stimulates the art of military and naval defence; and the art of diplomacy at length becomes a part of the studies of the statesman. Religion becomes gradually part and parcel of state-policy; and the religious and political establishments lean upon each other, and receive and confer a mutual support. To domestic luxuries an extending ingenuity at length begins to add imported luxuries, and a foreign trade and

a mercantile navy find a beginning, which in due time involve the creation of an armed navy. The use of foreign luxuries naturally gives rise to schemes of colonization; to this the growing desire for the precious metals, and the rapidly increasing use of money, add a fresh stimulus; and the complications of social wants, social pursuits, and social lust of acquisition, ramify in all directions, and extend themselves over the globe.

If the foregoing paragraph may be allowed to pass for a brief and rapid recapitulation of the leading and salient facts which mark the onward progress of civilization, one conclusion may, I think, be admitted, and without hesitation, to flow from what has been adduced. The conclusion, to which I point, is this—that all this wonderful and complex mechanism, styled a high state of civilization, may be distinctly and certainly traced back to three or four simple bodily wants as constituting its origin. In the necessity for food, shelter, and the multiplication of the species, the seeds of the whole wonderful harvest are to be found. They are few, and simple, and altogether referable to bodily conditions; nor need we to hesitate, if the existence of matter be assumed and allowed, to admit that the part which it plays in the production of these complicated mental phenomena, through the agency of which men's minds are tried and disciplined, is extensive indeed.

This, however, is only a limited portion of this curious, but very comprehensive and striking, enquiry. There is much more behind, inseparably connected with that which has already been noted and recapitulated. The modifications of society are necessarily and certainly linked to other material modifications, which help to form the whole of the series of material phenomena on which the material theory is based. These, however, must be reserved for another letter. They are so multifarious, and, at the same time, so remotely connected with the phenomena already described, that the argument, of which they form the ground, gains double and triple force from that very remoteness. The connection between the two is, however, undeniable and indisputable. The entire series of phenomena, from first to last, must be dealt with as a whole; and if improbability,


and improbability to an unexpected extent, be the result, it cannot be alleviated by any denial of the inseparable connection of the phenomena with each other, or of their relevancy to the argument and its conclusion, to which they directly lead. These phenomena and that argument will form the subject-matter of the next letter.

LETTER XVI.

WHAT IS THE USE OF MATTER?

IN the course of the last letter it was attempted to be shown that the social state, which we are accustomed to style "civilized society," may be certainly traced back to three or four bodily wants, and that the endless modifications, of which these wants are capable, form the greater portion of the complex machine of civilization. It is true that when inequality of rank and possession is brought about, the passion of ambition is stimulated much more highly, and men aim at power and fame, seemingly, for their own sake. This, however, is, probably, more apparently than really so. It is probable that, at the bottom, fame and power are prized because they better secure for their owner the sympathy of mankind in the hour of need, and resolve themselves into a possible corporeal advantage. Be this as it may, it was endeavoured to be shown that the aim and end of all this mechanism was to act upon, and discipline, and subject to various tests, the powers of the human mind; and that this was admitted on all sides. Assuming, then, that this point was successfully made out, and demonstrated satisfactorily, we here obtain a theory to prove that matter is, at all events, of use to something else; or, in other words, that it is a medium for civilizing the human mind; for adding to its pleasures by extending its range of impressions, and increasing its strength by evoking powers, dormant until so roused to action.

In doing this, however, we are far from arriving at the bottom of the question. We have, to be sure, taken the most salient points, and constructed, with reference to them, a theory that is, perhaps, more than plausible; but this is doing little. All this is, as it were, upon the surface. And even this is obtained at the expense of an



assumption which is, in many respects, incompatible with material existence, as defined and as assumed to be employed. We admit—because we cannot help it—that the innumerable changes, which are the result of the civilizing process, may be traced back to three or four bodily wants; but, as far as the body is concerned, we soon discover that no beneficial purpose, much less any beneficial result, can be shown. The material effects of civilization all resolve themselves into food and shelter; or, in the words of our great moral poet—

“What riches give us let us, then, enquire.

Clothes, fire, and meat. What more? Meat, clothes, and fire.”

To stop there, then, would be to define the system of life as a mere tissue of purposeless and unmeaning changes. How do we escape from the dilemma? By an enforced leap to another conclusion, that man's nature is “twofold;” and that he is “endowed with a reasonable soul;” and that the purpose of these social changes, brought about by the operation of a few bodily wants, has no reference to the body, but to the higher or mental part of the man, which is, hereby, tried or disciplined.

I have already pointed out the absurdity of the terms “union of soul and body,” and how utterly impossible it is to conceive that immaterial existence, which has no reference to place, can be united to material existence, which cannot be supposed to be, except in some particular place. In short, I have already shown that the ideas of place and space, which are necessary to enable us to form the idea of matter, are so far from being necessary to the conception of immaterial existence that they are really incompatible with it. And that, hence it follows that, to talk of an immaterial spirit occupying any place, is as gross a metaphysical solecism as it would be to say that an existence, one of the qualities of which is that it has no need to be in any place, must yet be in some place. Having already demonstrated this, I shall not press it further in this stage, but go on to say that to stop at the point, at which we have now arrived, seems to me to be impossible, in any rational view of the position. This I shall essay to make manifest to the candid enquirer.

We have already seen that from two or three simple, bodily wants, that may be comprehended under the general terms "food and shelter," circumstances have caused gradually to arise a vast series of modifications, or rather complications, all representing different modes of meeting these simple wants, which a complex state of society has rendered necessary, or desirable, or pleasing. And we have, likewise, further seen that, to meet these growing wants, created by the process of civilized society, great changes of the earth's surface have been necessarily effected. Agriculture has been commenced and made almost universal; horticulture has followed in the train of agriculture; mines have been dug; forests felled, and lakes and marshes drained; cities and towns have been built; maritime enterprise fostered; fleets constructed; foreign products naturalized; and even climates have been changed and ameliorated. In all this we, past doubt, have evidence that matter, in the view of the materialist, has been of use to something else. That it has helped to discipline the human mind, through numberless generations; and out of the savage, with a few simple ideas and simple wants, to evolve the educated, the scientific, and the philosophic man.

All this, however true, merely touches the surface of this question. If man were the only living being, and the earth's present surface all that pertained to it, we might possibly have stopped here; not convinced perhaps, but not altogether dissatisfied. This it is, however, clearly out of our power to do. The present surface of the earth is only a surface that has succeeded many former surfaces. It has innumerable living inhabitants, of all grades, over and above the human race. The former surfaces present plentiful and undeniable evidence, that they, at one time, were inhabited by millions of living creatures now removed, or extinct. Yet these surfaces, classed chronologically, as formations, by geologists, only form a thin crust on the superficies of the material globe. What is the interior? Various hypotheses have been hazarded as to its nature, state, and density; and some experiments tried to help to solve these queries. But, in no case, I think, has any one asserted the interior of the globe to be a vacuum. No hypothesis makes empty space of it. Then comes the

question upon us, and with force irresistible—how are we to deal with all this? Are these living organisms altogether material? Are we to conclude that beings, capable of sensation, consciousness, memory, thought, and ratiocination of a limited sort, are merely atomic machines—locomotive automata? Or are we to conclude them to be phantasmagoria?

Those readers, if there be any such, that have followed me, step by step, through this enquiry, will, here, discover, and almost unexpectedly, that we have got to a critical stage of the argument. The student of the works of Berkeley will find that he is, here, deserted of his master. Nor will the materialist, nor will the comparative anatomist, help him out of his difficulty.


The truth is that, admirable as is the logical power of the celebrated treatise "*On the Principles of Human Knowledge*," and admirable as are his other writings which go to confirm and more completely establish those original principles, yet the whole is only a fragment. They merely constitute, in the aggregate, the first, grand step of a philosophy, never carried out by Bishop Berkeley himself, nor by any follower. Whether Berkeley shrunk from pursuing his theory into all its consequences cannot be known. He has failed to do so: and if he stopped short and left idealism a mere philosophical fragment, he has only followed the example of his materialist opponents, whose theories, when examined, will be found equally imperfect and unsatisfactory.

Berkeley affirmed the visible and tangible world to exist only in his own mind, or in the mind or minds of another being or more beings, of the same spiritual nature. There, however, he stops. He does not say how far he carries his definition of the term "spirit;" nor does he explain the process by which he knows that other spirits exist. In short, Bishop Berkeley does not explicitly tell us whether he means by "spirit" everything that is capable of receiving sensations and ideas, or whether he limits the definition to man only, and ignores any spiritual existence less than man, or inferior to man. Nor is the materialist more explicit than the idealist. He assumes "a twofold nature" for man. He admits that, although the

nervous system may be the machinery or material medium through which the sensations of touch, sight, hearing, taste, and smell, are conveyed to the mind, yet they are felt by the mind only, and apprehended by the mental or spiritual portion of the man alone. Thus, both the idealist and materialist stop short at man; as if man were the only living being—the only being capable of consciousness, sensation, memory, or reflection. How is this to be explained? Can we so stop short? And if we can so stop short, under what conditions do we stop? These are the questions now to be answered.

For the Berkeleyan idealist there is not, as it seems to me, any middle course. He must either deny, altogether, the existence of the lower animals, or he must admit them to be immaterial beings of a lower order. If once admitted to exist, it must be admitted that they are capable of receiving impressions of touch, sight, hearing, taste, and smell; and we have already seen that such impressions are received, only, by the mind or soul of the recipient, and that brute matter is incapable of sensation, much less of thought.

If we take the materialist's side, we shall be in a dilemma just as fatal. The materialist must admit that the lower animals, down to the very molluscs, receive sensible impressions; and that some of them not only recollect them, but reason upon them in some limited degree. In the materialist's view of this matter, the lower animals receive sensible impressions through a mechanism similar to that of man himself. The elephant, the ape, the ox, and the dog, have a brain and nervous system, similar to those of man. If we take the sense of sight, we shall find that, from the elephant and ox, downwards, to some of the species of molluscs, the structure of the eye is the same or very nearly so. There is in all a pupil, a retina, and an optic nerve, as in the human eye. We have already seen that, in man, the office of the optic nerve is to convey the picture on the retina to the mind or principle of consciousness, in short, to the immaterial soul. What does the materialist make of the optic nerve of the ape, the elephant, the ox, or the mollusc? Does he admit them to possess an immaterial principle of consciousness and sensibility? And if he does, can he conceive that immaterial principle subject to dissolution?



Matter, which is composed of atoms, he holds to be subject to constant decomposition and rearrangement. Can he predicate this of the principle of thought, which is not composed of parts? If, on the contrary, he asserts that the immaterial consciousness of the lower animal may, for ought we can know, perish with the body of the animal, of what use is either? The body may, it is true, possibly form some portion of the food or clothing of man, and thus far be of use. But to place an immaterial principle to vegetate, for some brief season, in the shape of a mollusc, can be no more of use than to produce sparks from an electrical machine, to glow for a moment and then perish.

Such are a portion of the difficulties that cling round these questions; but there are others just as puzzling. We are here dealing only with the mere superficies of the globe. Geology, however, penetrates a trifle beyond the mere superficies; and geology assures us that underneath the existing surface are to be found proofs, numberless and indubitable, of the former existence, long before man appeared upon earth, of various tribes of living animals, now all extinct, from the trilobites and earliest fish organisms, through the gigantic saurians and strange pterodactyls of the oölitic formation, to the megalotherium, mastodon, pachytherium, and megalonyx of the tertiary system, and the mammoth and gigantic elk of the post-tertiary formation. In addition to these, there are remains of numerous shell-fish, and of those organisms, such as sponges, molluscs, and medusæ, that approach and mingle with the vegetable creation; and with these we find ample evidence of the existence of trees and plants, of every variety of structure, now destroyed, and replaced by analogous varieties, more or less differing from the old.

How are we to view these phenomena? Are we with the Berkeleyan to ignore them as mere phantasms? Or are we, with the materialist, to pass them over as extinct beings, never capable of more than a few limited sensations, of no use to others, and of little or none to themselves; being unconnected with any general progressive series, and miserable wrecks only of a dark, dismal, and mysterious past?

This, however, is not the whole. These remains, found amongst the *debris* of the ancient formations, setting all chronology at defiance, and taking geology beyond the utmost stretch of conceivable time, refer only to a thin crust, covering the inner depths of a globe, the nature of which puzzles conjecture, and after leading philosophers into a chaos of surmise leaves them there to flounder, in or out, as they may. If, then, we assume that the vast interior of the globe is formed of material substance of some kind or description, what use shall we assign to it? To itself it can be of none. To others it can be of none; for no eye has seen it, and no intellect knows one syllable concerning it. To the forlorn alternative we are finally driven of assuming that the material interior is absolutely and positively necessary to support the material superficies; and that millions upon countless millions of tons of "brute matter" are put there for that sole purpose.


Thus, then, if we take the earth and its living inhabitants, it seems to follow that the substance forming the whole, according to the theory of material existence, is really of very little use to any portion capable of receiving benefit, and that benefit comes in the most clumsy and roundabout way. The word "use" I have already explained, as being only, with propriety, applicable to mind. "To be of use" is to supply a need or confer a pleasure; and the cognizance of a want and the feeling of gratification are mental processes. Salutary discipline and innocent gratification can only be attained through sensation and reflection. Is it, then, philosophical to believe that the Creator should cause to exist all this huge mass of brute matter, as a means of conferring sensations which he could confer by His direct act, or failing that, by the ministration of immaterial beings who may themselves be receiving advantage by the process? To believe that, we must believe that the great Omniscient First Cause may be induced to attain an object by a clumsy, circuitous, and unintelligible method, which he might attain directly or by a far preferable method, that is to say, as far as our limited faculties may judge of such subjects. This seems to me to be abundantly clear. To those who have read aright the work of Benedict Spinoza it must be known that he has amply demonstrated that, whatever

qualities be assigned to matter, these qualities can only be upheld by the continuous act of God. Hence the often-mistaken term "*Anima Mundi*," which is only intended as an expression, in two words, of the great truth that material substance, be it what it may, can only be upheld in existence, together with its qualities, by the Divine power constantly exercised thereon. Without this the conception of the reality of material existence is impossible. Thus, then, the conclusion to which materialism conducts us is this, that the Creator is constantly employed in upholding huge masses of matter for the apparent purpose only of these masses being the vehicles of certain sensations produced in certain spiritual beings, asserted to be connected, in some way inconceivable, with these material masses; although the same sensations might be given directly, or through a better and a more intelligible medium. That the intelligible portion of this theory is liable to the charge of extreme improbability, as well as of extreme clumsiness, seems to me to be undeniable. At the same time it involves the absurdity of the action and reaction of matter and spirit, although they have not one property in common. In short, the entire notion, or scheme, of the union of matter and spirit in one being is full of contradiction and incomprehensibility. We have seen that the very attempt to treat material substance, extension, space, and time as things really existing without the mind, involves contradictions upon contradictions in every direction. To talk of a union between that which has no relation to place, with something else which can only exist in virtue of being in some place, is only adding another to the list. To assert anything so inconceivable as the action of matter upon spirit, and again of spirit upon matter, whilst it is admitted they have not one quality or property in common is only a fitting climax to that which went before. To style that "a philosophy" which involves contradictions, manifest and manifold, seems to me to be neither more nor less than a perversion of the term. It will be found, on enquiry, that the adherence to these incompatibilities has, in all ages, produced that mental bewilderment and chaos which has been termed "scepticism;" a mental confusion, the result of a hopeless struggle to reconcile the contradictory.

LETTER XVII.

IS NOT MATERIALISM THE PARENT OF SCEPTICISM?

To answer this question, in detail, would require a treatise, and one of some length. It is, therefore, inconsistent with the plan of these letters to answer the question in detail. I must content myself with a mere rapid tracing of my general view of this topic, and leave the reader, who may have patience and inclination, to work out the details for himself. To enable him to do this, I may be permitted to refer him to the excellent and lucid "Biographical History of Philosophy," by Mr. G. H. Lewes. It is equally admirable in matter and arrangement; and whilst writing such rapid remarks upon this topic, as I shall venture to make, I shall do so with Mr. Lewes' volumes before me; his "Epochs" forming for me, as it were, a line of guide-posts over an otherwise trackless waste. From some few of Mr. Lewes' minor positions I dissent. From his conclusion that a system of philosophy, which shall be, at once, true and satisfactory, is "impossible," I must also dissent. We are, as yet, in the very infancy of knowledge. To be sure that anything is ultimately impossible to the human intellect, as far as the attainment of knowledge is concerned, is the real impossibility. In Mr. Lewes' work we have, however, a mine of information and learning, lying ready to the hand of the metaphysical student, and which he will find invaluable. It will, generally speaking, tell him all that is worth knowing of moral philosophy, up to the present time. To Bishop Berkeley's views he has done scant justice. In this, however, he is only like the rest of the world, who have yet to make the discovery that the fragment which Berkeley has left, imperfect as it is, will one day form the foundation upon which a new philosophy will be erected. The foundation is there; the superstructure is still to come.



The ancient records of philosophy being all Greek, Mr. Lewes very properly begins with Thales. On the question, however, whence had the Greeks their philosophy he says little. Egypt has been assigned as its source; and of the higher and better part of it Egypt probably was the source in a secondary sense—the Egyptian priests having probably obtained their notions from India. For that the Brahmins had speculated deeply in metaphysics, as well as mathematics, Mr. Maurice and others have obtained evidence. That they anticipated the fluxions of Newton and Leibnitz seems to be highly probable, if not certain; and there appears good ground for supposing that they had, in some sort, forestalled Berkeley's *Treatise on the Principles of Human Knowledge*, by calling in question the reality of a material universe, and by resolving everything into mere sensible phenomena or mental perceptions.

Mr. Lewes divides his history of ancient philosophy into nine epochs. In the first he deals with the physiologists, the mathematicians, and the eleatics; under which heads come Thales, Anaximenes, Diogenes (of Apollonia), Anaximander (of Miletus), Pythagoras, Xenophanes, Parmenides, and Xeno (of Elea).

These names sound well, having the advantage of the prestige that attends upon all derived from ancient Greece; yet they only serve to give weight to speculations of a most crude and unsatisfactory character. Their staple is materialism in some fantastic form or other, although this is not true of the whole. They were, past doubt, men of most subtle and, in some respects, of refined minds. Xeno, of Elea, Parmenides, and Carneades, were especially so; the latter, apparently, being a favourite author with Cicero, who, in his tract "*De Naturâ Deorum*," quotes him repeatedly.

The second epoch of Mr. Lewes comprises notices of the philosophy of Heraclitus, of Anaxagoras, of Empedocles, and of Democritus. These, again, all partake, more or less, of the materialist. In attempting to construct theories as to the nature of existence, air is assumed by one, fire by another, as the primary and original element. Empedocles assumed four original elements—earth, water, air, and fire. Democritus inferred the existence of atoms infinitely small,

invisible and intangible, separately; of which all solid, visible, and tangible substance was composed. He affirmed, however, that the senses are imperfect, and not to be trusted—ideas being only imperfect copies of the external qualities of matter, and giving no knowledge of the substratum in which these qualities inhere. His doctrine of atoms, however, he rendered inexplicable by denying them solidity or weight, and resolving them into a “force,” a phantasy which modern times have again and again revived. A force, which is not the force of anything, is an inconceivable abstraction, really destitute of meaning. Such are the contradictions involved in materialism.

The third epoch of the author of the *Biographical History of Philosophy* treats of that “much calumniated race, the Sophists.” Of the real teachings of this extraordinary sect of talkers and thinkers we know nothing—save and except at second-hand. They have been accused of inculcating immoral doctrines by contemporary thinkers who were their rivals. Plato was the principal of these; but, then, says Mr. Lewes, Plato “had every reason to dislike the Sophists and their opinions.” Besides this, there is, in some cases, and ever has been, and possibly ever will be, much difference of opinion as to what is moral or immoral. It is a matter of dispute still whether Machiavelli was or was not, as a political teacher, immoral; and whilst the many deem Spinoza a hardened atheist, deeper thinkers see in him a devout, and reverent, and profound theist, with the most sublime and refined notions of the wisdom, power, and benevolence of the great First Cause.

That the Sophists taught the arts of logic and rhetoric, as advocates, and showed the best methods of baffling an adversary is certain enough; but this is allowable where there are pleaders on each side. As to the philosophy of the Sophists the historian says little. It was probably the current doctrine of the hour; and we have seen what that was likely to be. If, as their enemies paint them, they were shallow and showy, loquacious and smart, rather than profound, little is lost if we be ignorant as to what they thought of a material universe; and, be it what it might, Plato, I shall venture to say, would not have much improved it.

The fourth philosophical epoch treats of Socrates. Of high

importance and character as a moral teacher and stern logician, he added nothing to the prevailing ideas as to the nature of existence, and of that which we accustom ourselves to call "the universe." That Socrates was a devout theist, and reverent worshipper of the omniscient and omnipotent ONE, from whom all being proceeds, and in whom everything that is rests—is amply manifest in the specimens of his teachings that remain to us. There, however, we must stop. It seems equally plain that he willingly acquiesced in the notions, still prevalent, of the mixed nature of man.

He held, in short, that in man were united a material principle, and a principle of which the attributes were sensibility, and thought, and reason. It is not, I believe, easy to ascertain and say certainly what the ancient ideas of "soul" precisely were. The vulgar idea of the Greeks, as well as of the Romans, seems to have been that the spirit of man was only an attenuated matter; a sort of ether, having some qualities in common with matter of the grosser sort. How far beyond that philosophy refined it is hard to determine. Philosophers always seem to have deemed that "soul" or "spirit" had relation to place. A man's soul was "in" his body and might be parted from it. They do not seem to have conceived of the immaterial as having no relation to space or to place. This was reserved for a later period. As far as I can judge, both Greeks and Romans deemed the "Umbra" to be a sort of thin attenuated ether. It was intangible; but still visible. It had a voice; but that voice was feeble and shrill. Homer, in the *Odyssey*, describes Penelope's suitors in their passage to Hades, after Ulysses and his son destroyed them, chirping like bats.

That Socrates was, at heart, a monotheist, and a believer in one Creator of all things is sufficiently certain. For safety's sake he might appear to pay some respect to the rabble of deities that made up, at all events, the exoteric religion of the ancient Greeks; but his real creed was in one supreme Ruler of all. The teaching of Socrates was, however, moral rather than metaphysical. Hence it is uncertain what his notions, as to the nature of the universe, might be. Probably they would be much like those of his contemporaries—a mixture of materialism with spiritualism, such as it was.

The fifth epoch of the philosophical historian comprises Euclid and

the Mezaric school, Aristippus and the Cyrenaic school, and, lastly, the Cynics, of whom the leaders were Diogenes and Antisthenes. These men, like Socrates, were much more of moralists than metaphysicians. Like Socrates, they held that there can be only one supreme Ruler of the universe. The Almighty they designated by different names, alluding to different attributes. "The one," "The sole good," or "The one intelligence," were only modes of indicating the great first cause. In this they agreed: in minor points they differed. What their opinion was as to some of the most abstruse and controverted questions of philosophy is uncertain. The Cynics, as led by Antisthenes and Diogenes, carried their contempt of riches, and, in truth, of most human pursuits to an absurd length, and seem to have included philosophy amongst the rest. In fact, Diogenes seems to have anticipated the "common sense" of Reid, and, dimly, the "objective knowledge" of Kant, in his mode of refuting Xeno of Elea, who, by a series of subtle definitions, seemed to have proved the impossibility of motion. Diogenes, in answer to the definitions, got up and walked. This was also anticipating Doctor Johnson, who confuted Berkeley by kicking a stone. Had Berkeley's principles been published in the time of Diogenes he would have confuted them after the same fashion. Xeno's definitions were probably another form of the difficulties which the assumption of material substance must ever create: and analogous to those which vitiate the method of fluxions, or prove that curves or circles are impossible; because as movement can only be in one direction at once, let us change it as often as we may, a circle still revolves itself into a polygon with an infinite series of sides. Enough, however, of this.

The sixth epoch of Mr. Lewes is filled with one great name, Plato (the broad browed), of whom the historian truly says that he has been more praised than studied, more quoted than read. Of this there needs not be any doubt; yet equally certain it is that the reveries of Plato, as bodied forth in his writings, have, in all ages, had a wonderful charm for a certain class of minds. I mean for those that mistake mysticism for depth, because they cannot see the bottom; and who are taken with subtlety of fancy instead of subtlety of perception; substituting inventive phantasy for analytic power.

In fact, so extraordinary was the influence of his writings, that something resembling divine honours fell to his lot after death. It was affirmed that he was not the child of his reputed father, Ariston, but the son of Apollo, who is fabled to have appeared to Ariston in a dream, and counselled him to delay his marriage with his betrothed bride, Perictione, a young virgin, who was already with child of Plato, through the favour of the radiant god. That this ridiculous story should have obtained a wide currency proves that even a refined philosophy was no cure for the credulity of a fanciful and enthusiastic people; but it also proves the immense power of the works of Plato over such a people.

Plato was, in fact, a philosopher grafted upon a poet; a dangerous compound. The poet is pretty sure to make a visionary of the philosopher; and the philosopher is equally likely to seduce the poet into a cloudy mysticism. That this was sometimes the case with Plato, will, I believe, be admitted.

Were I competent to such a task, to attempt to give any detailed account of the teaching of this wonderfully gifted man, would be quite apart from the purpose and object of these letters. Suffice it to say that on the question of material existence he seems to have, in a great measure, adopted the notions of his predecessors and contemporaries. Feeling the inability to banish from his mind the idea of space, he concluded it was something existent from all eternity, independently of any will or act of the Creator. Many centuries afterwards, the much misapprehended and misrepresented Benedict Spinoza, ran upon the same rock. Feeling, further, the impossibility of conceiving the creation of material substance, as defined by philosophers, out of nothing, Plato at length concluded that matter also had existed from all eternity. He also fancied to inhere in it a certain stubbornness, which baffled the Creator and was the origin of all evil; thus sowing the germs of a heresy, long after, hotly debated, as the heresy of the Manichees, or disciples of Manes, in the earlier Christian churches.

Another mighty name, Aristotle, fills the historian's seventh epoch. The pupil of Plato, his mind differed essentially from that of his master. He was eminently logical and practical; gifted with vast

powers of observation, discrimination, and method ; and the founder of a philosophy that all but ruled the world for centuries. He, too, was, however, a decided materialist; but in dilating upon the universe, as apparent to us, he seems to have almost allied immaterial to material existence. By setting up these forms of existence, and fancying the heavenly bodies to be a sort of connecting link between thought and brute matter, that is to say, less spiritual than the Creator, but less material than the everyday matter which we deal with, he hoped to bring all three into contact, and as Spinoza afterwards did, made the great Creator a sort of "*Anima Mundi*," and the human soul a divine emanation, having thought and reason, whilst the body was perishable stuff, destitute of the faculty of thought. This theory is a sort of second edition, with additions, of that of Plato, and involves as many, or more, difficulties. What it led to the eighth epoch will show.

Mr. Lewes commences his eighth epoch by remarking that "amongst the curious train which accompanied the expedition of Alexander into India, there was one serious, reflective man, who followed him with purely philosophical interest; that man was Pyrrho, the founder of the sceptical philosophy." This fact is both highly curious and highly instructive; and I am inclined to put more weight upon it than Mr. Lewes has done, although I have no fault to find with the manner in which he speaks of Pyrrho, and his scepticism, life, and character.

Pyrrho, past all doubt, accompanied "Macedonia's madman" on his extraordinary expedition owing to one overpowering motive. He had, doubtless, satisfied himself that the Greek philosophy had, for the most part, been derived from distant sources. He had seen that Egypt had supplied a portion; and he had further seen that this portion was not originally Egyptian, but was also derived. Thus all the circumstances seem to indicate that Pyrrho had concluded that in India was to be found the cradle of civilization and nursery of all science; and that there might exist an advanced philosophy, by means of which the jarring notions which rendered that of the Greeks a sort of philosophical chaos, might be explained and finally

reconciled. Nor is it improbable that conclusions, not very dissimilar, had led the son of Philip, and pupil of Aristotle, to contemplate the conquest of India. He, too, probably, had persuaded himself that knowledge and wealth, not to be found elsewhere, existed in the East. His genius taught him to know that a precocious civilization and a too rapid advance are symptoms of weakness as well as of mental activity; and hence, doubtless, he anticipated an easy conquest of the power, wealth, and science, of the oriental world. And Pyrrho was right, and so was his Macedonian patron, though both missed the grand objects of their bold enterprise. Alexander stopped at the Indus. Pyrrho returned, convinced that the philosophy he had been taught was untenable, but unable to master the philosophy which met him in the East. What was that philosophy?

It would be altogether foreign to the purpose of these letters to go into any detail as to the learning of the East, as far as it is yet known. It is notorious, however, that some great modern inventions were there anticipated—nor are modern science and modern philosophy quite so new as they were once deemed. Newton's fluxions, it is now believed, were known to the Brahmins; and Mr. Maurice has shown that Bishop Berkeley's doctrine as to the nature of human knowledge, and his denial of a material universe, made part of the metaphysical lore of oriental thinkers. In this we have an ample explanation of the perplexity of Pyrrho. Unable to prove that matter or space existed except in idea, he was unable, as the eastern sages did, to dismiss either from his belief. Hence, he was driven to the conclusion that philosophy was impossible, and that uncertainty alone was certain. He boldly said so: and taught scepticism during the remainder of his life. He and his scholars held that the nature of things is unknowable, and enquiry vain. They dared not affirm material existence, nor pretend to say what it was. They dared not to refer all to the mind. They were powerless in both directions; and thus the reasonings of philosophers, from Thales to Pyrrho, ended in a blank scepticism as to that which is most important to man, the nature of his own existence, and the origin of the sensations and ideas which constitute his life.


After Pyrrho came Epicurus, the Stoics, and the new academy as formed by Arcesilaus and Carneades. By Epicurus the hopeless theory of atoms was revived, only to give rise to the disputations and perplexities that followed; some new in shape, but all old in origin. Into the morality of the Garden, or that of the Stoics, this is no place to enter: nor would it answer any purpose to review the teachings of Carneades and the new academy. The scepticism of Pyrrho still stood in the way, a shapeless spectre, that could not be vanquished nor shut out.

The ninth epoch of ancient philosophy describes the Alexandrian school, which found an end in the unintelligible reveries of Proclus. Thenceforward, theology was seated in the chair of philosophy. The old Greek mind, once so vigorous, seemed to be worn out. The priest made himself judge not only of theological but of scientific and philosophical controversies; and questions of science or philosophy were decided by the arbitrary application of some scriptural text, expressive probably of the popular notions of the time when it was written, but no more inspired, at all events, on subjects not religious, than any other piece of writing.

LETTER XVIII.

IS NOT MATERIALISM THE PARENT OF SCEPTICISM?


AT the close of the last letter, I had to record, after the extinction of the Alexandrian school, the triumph of the priest over the philosopher. An inscrutable Providence had decreed the necessity of that triumph. Greece, together with Egypt, and the rest of what then constituted the civilized world, had been made to form a part of the Roman Empire; and the Christian religion had become the religion of that empire, and an integral portion of that civilization. There was controversy betwixt the Latin and Greek Churches certainly, but it was Christian controversy. But the Christian religion could not preserve the Roman Empire from that decay which seems to be the fate of all dominations. The Roman world became incurably corrupt, and, as an assured consequence of that corruption, gradually and entirely emasculated. It was impossible but that religion should suffer during this sad process; and it did suffer. The active spirit of Faith imperceptibly waned into a gaudy but lifeless ceremonial; and mere scholastic disputes and verbal and metaphysical subtleties, like the ivy round the tree, gradually poisoned the healthy energy of a simple but energetic belief. The emasculate empire, at length, succumbed under the rude, but now resistless, blows of an outside barbarism. The wreck was almost total. Laws, manners, literature, language—all disappeared; and religion alone survived the ruin of civilization, in order, after a long struggle, to restore it. To the Western or Latin Church we owe such portions of Grecian and Roman literature as remain to us; and, more than that, to the Catholic Church we owe the establishment of representative systems of government, where circumstances would admit of them. But, with returning civilization and freedom of thought upon secular subjects, the Church could not



retain that theological despotism over men's minds which fell to her lot after the extinction of the Alexandrian school of philosophy. Philosophical speculation was sure to revive, and did revive; and I am now to sketch its progress; to show to what it has led; and to prove that, with the exception of the theory and works of George Berkeley, Bishop of Cloyne, we have not advanced philosophic science one single step beyond the position where the Greeks left it.

It appears to me that Renè Descartes Duperron ought to be considered the parent of modern philosophy, or rather the modern restorer of philosophy, as disenchained from theology. Mr. Lewes places him in his second epoch, putting Bacon before him. Bacon, doubtless, was the great founder of the inductive method; but Bacon was not a metaphysician, and metaphysics have less to do with induction than most other sciences—though I am far from saying that a time may not come when the philosophy of mind may be advanced and established by means of actual experiment.

Descartes was born in 1596, in Touraine, of Breton parents, and was educated by the Jesuits. At the Jesuit college of La Flèche he was taught that which his teachers took for philosophy; but he seems to have left the college with a supreme contempt for both doctrine and teachers. This admirable and extraordinary man seems to have, at once, despaired of obtaining anything worthy of the title of philosophy from books. That which had been written and taught sufficed him nothing. He saw that it abounded in difficulties, contradictions, conjectures, and assumptions of various sorts, and finished in the incertitude or rather mental chaos of Pyrrho and the sceptics. To chain philosophical reasoning to theological dogma was, he saw, to cripple it for ever. He wanted a certain foundation on which to build, and he sought it in the examination of his own mind; in a comparison of his own conclusions with those of thoughtful men; and lastly in the elaboration of a method which should lead, if possible, to certain results. He travelled; he for a short time led a military life; he conversed with men of all grades and all modes of thinking; and at length retired to Holland, where he produced or projected the works which have caused him to be held as the father of modern philosophy.



Descartes placed philosophy upon its true foundation : our certain knowledge of our own existence. His "I think, therefore I am" is, no doubt, a superfluous conclusion, because that which we know objectively and directly—the existence of the ego—must precede all conclusions and all reasoning whatsoever. Yet our positive consciousness of the existence of our own mind is a certain foundation for all that follows ; because we are, at the same time, sure that our mental perceptions are derived and not innate. Our own existence, and that of God, are, therefore, proved at one and the same time, and by the same certainty and directness of proof ; that is to say, by objective and immediate knowledge. Descartes, therefore, sets out an immaterialist. He also, however, could not get rid of the idea of extension or space ; and as space without matter is useless, and as extension is quite distinct from thought, he inferred that matter incapable of thought must exist. Thus we are brought, once more, into the presence of the two incompatibles—into the presence of spirit whose attribute is sensation and thought, which has no relation to space or locality, which is not visible, not tangible, and which has not one quality in common with matter ; and then into the presence of material substance, having the attributes of extension, shape, colour, tangibility, visibility, locality, and motion, but no capability of thought, nor any one quality in common with spirit. Descartes, therefore, commencing a spiritualist, ends a materialist ; and the path to blank scepticism, and the Pyrrhonic chaos, is again opened out to travellers along the difficult road of metaphysics.

With Descartes is classed Spinoza ; one of the greatest of thinkers, and one of the most misrepresented and misunderstood of those who have undertaken the thankless and perilous task of teaching mankind. Yet wonderfully subtle, wonderfully logical as he is, he split on the very rock which wrecked his predecessors with regard to the material theory. Spinoza could not dismiss from his mind the idea of extension : and because, for reasons not difficult to assign, it is necessary to our present state that it should remain constantly in our mind, Spinoza conceived it must really exist. Matter he deemed a mode of extension ; as the idea of matter can only exist in our mind with that of space. The first is requisite to the second. Spinoza failed to see

that, in fact, that which we call an idea of space is mere negation, or, in plain terms, nothing.

Let the reader try the experiment. For instance it is easy to imagine a solid surface, of some colour, one foot square. Annihilate this solid surface and try to form a positive idea of that which is left. It will be found impossible. We may say, in words, the space the square solid occupied is left. But these words mean nothing, because they convey no idea.

If we try to get a positive idea of a square foot of space, it must be a visible one, space being intangible. But, in doing this, we must supply colour: for we only see colours; and no mind can form an idea of a square foot of space without the idea of colour. The idea formed is of some colour a foot square. Take away the colour, and nothing remains.

This seems to have been the sole difficulty that kept Spinoza from being an idealist, and prevented his anticipating Berkeley. Having once adopted the notion that extension, or space, was a distinct existence, the assumption of material existence followed of course, or else absurdity resulted. Space without matter could not be of use to itself or to aught else; for immaterial existence or spirit has no relation to extension or locality. Hence, to assume space without matter was to assume a mere nullity, useless and superfluous. This seems quite undeniable: and it appears to be just as certain that, admitting Spinoza's own notions, as to material existence, this was only adding one superfluity to another.

This great man saw that which philosophers before his time failed to see, to wit, that, define matter as you may, or call the unknown substratum what you will, in which its sensible qualities are said to inhere, still it follows that this substratum, and these qualities, can only be conceived to be upheld by the constant operation of the divine power. This Spinoza saw: and hence his expression that God was "*Anima Mundi*," the soul of the world. This undeniable conclusion has been strangely tortured into a charge of atheism. Atheism it is not; but the very reverse. It involves, however, a great superfluous improbability. It assumes the Creator to be constantly employed

in upholding a complex machinery merely to convey impressions which might be directly conveyed to the mind by an exertion of the same power. It, also, involves the difficulty of conceiving matter to act upon mind, with which it has no quality in common; when the same impressions might be conveyed by a subordinate agency, similar in nature and attributes, and capable of feeling as well as conveying sensation. The extreme clumsiness of the scheme, which assumes brute matter as a means to convey impressions to sentient or cogitant beings, is best shown by a familiar illustration. If we suppose a condition of existence which rendered it necessary for everyone to have a constant knowledge of the time of day, would it not be absurd to suppose the Creator, instead of directly giving us, or providing us with the means of obtaining directly, the requisite information, were to be constantly busy making and keeping in order a number of watches sufficient to supply each individual with the knowledge of the hour? Yet this correctly illustrates Spinoza's material hypothesis.

It is singular that this acute thinker, like many others, should fail to see that extension is really a quality, and can only be when there is something to be extended. In fact extension can no more exist, independently of that which is to be extended, than motion can exist when there is nothing to be moved. It is impossible to conceive extension in the abstract. We can conceive a square superficial foot of some colour. Take away the coloured superficies, and no idea is left. The mind may struggle to get an idea of the space occupied by the coloured superficies: but to obtain that idea some other colour must be substituted.

The third epoch of the Biographical History of Philosophy is occupied by Hobbes and Locke. The first is remarkable for being the first metaphysician who has clearly understood, stated, and proved the doctrine of philosophical necessity, as opposed to the unintelligible notion of the freedom of the will. Locke, in his noble essay "On the Human Understanding," demolished the doctrine of innate ideas, and clearly, I think, demonstrated that all our knowledge is obtained through the senses, and merely consists of impressions made upon us, and remembered, and reflected upon. Both Hobbes and Locke were,

however, materialists, as far as an external world is concerned, and Spinoza's doctrine was the nearest to spiritualism until Berkeley published his famous tract "On the Principles of Human Knowledge."

After Locke comes Leibnitz, who was also a materialist. He however, saw the insuperable difficulty of conceiving any reaction between mind and matter, and to evade it framed one of the strangest and most gratuitous theories that ever occurred to the mind of human being, the hypothesis of "a Pre-established Harmony." In short, Leibnitz fancied that the soul and body were two independent machines, like two clocks, so nicely adjusted that when one points the hour the other strikes it; to such strange fantasies does the assumption of material substance conduct us! Locke evidently perceived that we are conversant only with ideas, and that we know not whether they represent external things correctly or not.* But he could not get rid of the assumption of their connection, in some way, with external matter; and the difficulty remained unsolved.

On the 12th of March, 1634, was born at Kilcrin, in the county of Kilkenny, Ireland, George Berkeley, afterwards Bishop of Cloyne, of whom, the philosophical historian justly says, "there are few men of whom England has better reason to be proud." His writings make the fourth epoch of Modern Philosophy. He is the greatest metaphysical thinker that the world has yet seen, or perhaps ever may see; and his moral qualities fully correspond to his genius, great and excellent as it was. "It is still a moot point (says his biographer) whether he was greater in head or heart." The poet, Pope, in a line, which cannot be accused of poetical exaggeration, attributes to him "every virtue under heaven." Such was George Berkeley, Bishop of Cloyne, one of the very few men who assist us to hope that, even in this state of existence, man's moral and intellectual position may become more noble than it now is.

As these letters have been written with a hope, on the part of the writer, that he might vindicate, and possibly advance still further, the philosophy of the illustrious Berkeley, he may be allowed, in this

* *Locke on the Human Understanding*.—Book II, chap. 23, sec. 37.

place, to give some reasons why the Berkeleyan theory has found so few followers, and so many detractors. In the first place, the teaching of Berkeley is directly opposed to that which we are in the habit of styling "the common sense" of mankind. Whatsoever our matured conclusions may be as to this matter, it is certain that the Creator's law is that we must act as if there were an external world. In this, the philosopher and the non-philosopher must behave precisely alike; and, under such circumstances, it is extremely difficult to convince even powerful minds that the truth may be really at variance with this condition, although such condition is necessary to the scheme of our present existence. It must also be kept in mind that Berkeley's philosophy is only a fragment. He assigned to man a spiritual nature solely. The existence of a material world he denied. But how he viewed the inferior living creation he has not told us; nor has he said what he thought of the vegetable creation; between which and the animal creation naturalists have, in vain, tried to draw a line. Hence, the writings of Bishop Berkeley, however admirable as far as they go, are only the fragment of a philosophy, and by no means satisfy an earnestly enquiring mind. From this cause it is that, although Berkeley has never been refuted, few have been convinced by him, and very few, indeed, have publicly supported his conclusions. His works stand like the fragment of a noble column amidst a desert. Since his time, no writer of great name has embraced idealism, or expressly denied the existence of a material universe; though some, as for instance, Hume, and some of the German metaphysicians, such as Kant, Fichte, and others, have enveloped the question in a cloud of doubt, almost amounting to an express denial.

The conclusion to which I find myself driven is, that metaphysical science really remains where Berkeley left it. Since his epoch, we have had the disquisitions, and doubts, and quibbles, and inconsistencies of Kant, of Hume, of Reid, of Fichte, of Hegel, of Hartley, of Priestly, and of Comte; but his demonstration of the immateriality of man, as an *ens cogitans*, and nothing else, stands alone, unassailable, and, in truth, unassailed by anything worthy the name of argument. That the fragmentary state in which Berkeley left his

philosophy led to the scepticism of Hume seems clear. He asserted the immateriality of man, but went no further. Upon this, Hume seized. Man then, said he, may be only a bundle of ideas, and there we may stop. He forgot that ideas must be the ideas of some mind, and must be impressed upon that mind; for no one, I think, will now deny that our sensations and perceptions are given, not taken; are subjective, not objective. Neither did Hume consider whether mind be not synonymous with life. Hume, in fact, was inconsistent throughout. After doubting the existence of matter, he gave a sceptical disquisition on "Causation," founded evidently on material notions. All we know of cause and effect, he argued, is "mere sequence." The effect follows the cause; but we see nothing of the *ligamen* that binds them together. Upon the principle of materialism this is true. We require a *ligamen*. If the cart follows the horse, there must be some connecting harness. But this does not apply to mind. Effect and cause are two mental impressions, the first following the second by the law of God. No *ligamen* is needed. No *ligamen* is conceivable excepting the law of God. The one is made to follow the other, arbitrarily, by the Creator, for a specific purpose; and there the mystery ends.

Thus far the teaching of Berkeley had not been expressly denied by any great writer, when Reid essayed to overthrow the ideal system by a flat contradiction. We have something more, he says, than sensations and ideas: we have perceptions. The mind, when it receives an impression from an external object, perceives the cause of that impression at the same moment—that is, it perceives the external object. Thus, according to Reid, the mind has a twofold action at one and the same time. It receives an impression, and, at the same moment, perceives the external object that causes it. In Kant's phrase, it is acted upon *subjectively*, and acts *objectively*, at one and the same instant. How else, asks Reid, came the common sense of mankind by the unanimous belief in an external world? The short answer to this is, to ask the followers of Reid, how mankind, when in the act of dreaming, happen to believe their impressions in sleep to be as real as those of their waking hours; since in dreams the perception of external objects must be wanting, as is agreed on all sides?

I must own that there appears to me to be little difficulty in showing why men set out universally with a belief in external objects, inasmuch as all our visible impressions are so arranged as to include the idea of distance ; and distance must be external, if it really existed. I have already shown that the infant deems all he sees equally near ; but that a very short time is requisite to give him the idea of greater or less nearness. This is also the case with the blind when sight is obtained. Both, at first, think all they see equally near. Both soon find that, with some objects, if they wish to verify their eyesight by a tangible impression, another sensation, that of motion, must precede the touch. They must go to the object to touch it. By degrees they learn to distinguish nearness and distance by the different appearance of distant objects. Hence, every landscape has a foreground, a middleground, and a horizon. Thus, externality, or distance, is impressed upon the mind and believed in from the first. But it is only an idea, early given us, for a specific purpose ; that purpose being that we may act as if there were external objects.

With regard to the disquisitions of the followers of Reid it is not necessary I should say anything. Nor need I do more than briefly advert to the verbal subtleties of Hegel ; the “vibrations and vibratiuncules” of Hartley ; the discussions “on matter and spirit” of Price and Priestly, with the proposal to define matter as “a congeries of centres of attraction and repulsion ;” or lastly, to Ferrier’s attempt to establish a sort of middle-term between the material and the immaterial. None of these writers seem to me to have done much either to unsettle or to settle the conclusions, doubts, and difficulties of those who preceded them. We read them with respect for ingenuity and mental subtlety displayed, but are neither satisfied nor convinced. Having no firm footing where we are, we run back and essay to find it, if we may, in the clear and masterly fragment of philosophy constructed by Bishop Berkeley. Failing that, there seems to be only one resource—to shut our eyes, in the despair of seeing anything intelligible, and acquiesce in the chaos of scepticism, to which Pyrrho, first, and Hume long after him, conducted all preceding philosophy.

LETTER XIX.

WHAT ARE WE TO SUBSTITUTE?

THERE is to be found, somewhere, in the works of St. Augustine, the following very singular and very suggestive passage :—"Soli musca preferenda est : quia sol vitâ caret, sed musca vitam habet." "A fly is to be preferred to the sun ; because the fly has life, but the sun is destitute of life." When he wrote this pregnant sentence, Augustine must have, at least, instinctively felt that life is, to a greater or less extent, synonymous with sensibility ; that sensibility is, to a greater or less extent, synonymous with mind ; and that mind is synonymous with spirit or immaterial substance, capable of sensation, memory, reflection, and thought. He must, at the same time, have felt that any mass of lifeless matter, however huge, being of no use to itself, must be only an enormous superfluity, unless it were useful to something else ; and that the sun, as far as the fly was concerned, was only of value as being of service to the fly, by being the medium of conveying to the living insect the sensations of light and warmth. Hence it follows that, if we suppose the fly to be the only living being within the sun's influence, the sun's sole value would be in warming and lighting the fly ; and it further follows that, if the fly ceased to be within that influence, the sun would only be an unmeaning superfluity ; useless to itself ; useless to anything else. Thus, it seems to be, of sheer necessity, admitted, on all sides, that, if we are to assume the existence of matter we can, at best, only assume it as a subordinate of mind ; as a lifeless medium for the conveyance of impressions to the mind, which might, otherwise, be conveyed directly, or else by subordinate beings, not material and more analogous to the mind to which they are to minister.

This being the position in which we stand, it seems only natural

to ask what necessity is there for assuming the existence of a material world, or universe; and why we should obstinately adhere to that assumption, despite the manifold contradictions and absurdities which it involves? It will, I think, be difficult to point out either the necessity for such assumption, or the rational ground for adherence to it, notwithstanding the contradictions involved, and all the other attendant difficulties.


To assert any necessity, properly so called, for the assumption appears to me to be out of the question. The impressions and sensations, which we attribute to the existence of an external, material creation, may be directly and immediately conveyed to us by the agency of the Creator. Is it possible to deny that this may be? Or they may be conveyed to us through the medium of immaterial beings of a subordinate order, but having some qualities in common with the minds to which they minister. This is certainly conceivable; nor does such conception involve any contradiction, as far as I can see. Where, then, is the ground in reason for our adherence to a series of assumptions which unquestionably do involve many difficulties and contradictions?

We have already seen that we cannot form any idea of extension in the abstract. We only arrive at the idea of some limited space, and then add to it, but still within limits. We have seen, moreover, that, without colour, we cannot conceive the idea of the most limited space. Turning to material substance, we have to confess that we do not know anything about it. The most subtle materialist can only attribute to it, without any proof of the truth of that which he asserts, certain qualities or modes, such as extension, colour, shape, solidity, and mobility; but when we ask in what these so-called qualities reside, he cannot answer. If we ask a materialist of what he imagines matter to be composed, what is the reply? Of atoms infinitesimally small. But we have seen, already, that we have no certain idea of magnitude in the abstract. That which he calls infinitely small, another differently organized being may view as very large. Relative magnitudes we can see, certainly; but of abstract magnitude we have no conception; and an atom infinitely small is a phrase destitute

of meaning; and so is the indivisibility attributed to it. We cannot conceive extension incapable of division, for it is easy to show that the smallest assignable or visible extension may be infinitely subdivided.

When we further enquire what it is which holds together the atoms said to compose solid bodies, what is the answer? Attraction. What is attraction? A drawing together. If atoms draw each other from a distance, they must act where they are not. If something else forces them to cohere, what is it? If material, what holds together the atoms of which it must be composed? We place the elephant upon the tortoise, but are no nearer a solution. All that enquiry can tell us is this—that the existence of material atoms; their attraction; their contact; their infinitesimal smallness, are merely a set of assumptions, destitute of proof, and, in themselves, really inconceivable and unintelligible, not to say contradictory.

Admitting, for the sake of argument, the existence of these huge masses of lifeless and brute matter, we cannot evade the enquiry into its utility. Of what use is it? It is admitted that to itself it cannot be of use. It must, then, be of use to something else; and that something must be immaterial, and possessed of qualities totally different from those attributed to lifeless, brute matter. What is that use? Upon the material hypothesis, the use of matter is to be the medium for the conveyance of sensations and impressions to an immaterial mind. That is to say a congeries of senseless atoms are to act upon a spiritual existence with which they have no one quality in common. This is utterly inconceivable by any intellect. Solid, extended, moveable atoms may be conceived to act upon substance having the qualities of extension, solidity, and motion. But spiritual substance has no such qualities. It occupies no space. It is not tangible. It is not visible. It has no relation to locality. Its attributes are the capacity of receiving sensations, memory, reflection, ratiocination. To assert, however, that solid, indivisible, senseless atoms can impart to it these sensations, is to assert something just as inconceivable as would be the assertion that a paving-stone may think. To immaterial substances sensations and impressions can only



be conceived to be conveyed by some other analogous substance, whether superior or subordinate, having similar qualities to a greater or less extent; but having nothing to do with extension, locality, shape, solidity, colour, or motion, as real qualities, though capable of conveying the impressions to which these names are given.

The foregoing are not, however, the only difficulties which the assertion of the material theory involves. There are others, and of a different description. It is evident that the lower animals possess a mind—more limited certainly, by far, than is the human mind, and divided from it by a clear line of demarcation, the incapability of progress; but still a mind capable of receiving sensations, capable of memory, capable of reflection, and a limited power of reasoning. Materialists do not tell us explicitly what we are to conclude as to the mind and consciousness of animals. Are they of a twofold nature, or are they not? If they be not, do they mean to assert that matter can think; and if they do that, how do they know that they themselves are not a congeries of thinking atoms? If the mind of the animal be immaterial, as is their own, do they believe it to be perishable? If they do, then do they hold spiritual existence to be liable to dissolution and decomposition, their own amongst the rest. If they do not, what, then, is the destiny of the animal mind, after the dissolution of the animal body? If it exist, it must exist for some purpose, use, and end. What are they?

These questions have not, as far as I am aware, been explicitly put and explicitly answered. Answer them as we may, however, they appear certainly to conduct us to two sets of conclusions, from which a final conclusion must be evolved.

The mind of the animal must be either material or immaterial. It must die with the body of the animal, or it must not. If it be material and die with the animal, then may the human mind be material and perishable, and the twofold nature of man a chimera and unfounded assumption. Thus, then, we are brought to the absurd conclusion that thought may be the product of mechanism, and owe its powers to a congeries of atoms, put together in some order. If we assert, on the other hand, that the mind of animals

is immaterial and yet perishes, we are driven upon another absurd conclusion, that immaterial substance, which is not composed of parts or divisible, but which is an absolute and sole essence, may yet be subject to decomposition and dissolution. Both these conclusions are inconceivable by the human mind, and are contradictory; and to rest in either would be to admit the possible truth of contradictions, which is to destroy the foundation of all reasoning.

From this there is only one escape. We must assign an immaterial mind to animals, and admit it may exist after death; and this we must do whether we assert the existence of matter or deny it. Materialist and Berkeleyn must first decide whether life and mind be not identical things, and the two words synonymous. Having done that, they must, either for themselves or with the aid of the materialist, decide whether vegetable life be not a modification of animal life, and also where it stops, and where that which is called material organism begins. It is true that an enquiry of this sort leads to the doctrine of there being species and genera in the range of immaterial existence; but what of improbability is there in this supposition? Let us examine it candidly, and so decide.

If we limit the enquiry to life, we shall find no difference in opinion betwixt the materialist and the spiritualist. Both know that from the simplest form of living organism there is long series of living animals growing more and more complex in organisation and ending in man. But then comes the question—can we separate life from mind? Is there such a thing as a living automaton, destitute of feeling or sensation of any kind? To me a living automaton seems to be an impossibility, a thing inconceivable. In vain do we endeavour to imagine life to exist without sensation; and where there is sensation there must be mind, however limited. The simplest living organism, that subsists through food, must feel the sensations of hunger and repletion, and must feel its own being. This the materialist must admit as well as the immaterialist; or he must venture the unintelligible assertion that there are sensations, which are the sensations of something that is not mind, of which he cannot give any account, or definition, of any sort.

Thus, therefore, whether we be materialists or spiritualists, we must, of necessity, as it seems to me, admit of a graduated series of intelligences or minds, beginning with the capability of having one, two, or three sensations at most, and rising upwards to man: who, having the capability of progress, adds indefinitely to the number of his perceptions as civilization proceeds. Where the *Ens sentiens*, or merely percipient being, stops, it may be difficult to decide. We must first decide whether vegetable life is, or is not, a species of mind capable of perceiving sensations in some limited way. To separate vegetable from animal life puzzles the materialist and physiologist. Where is the distinctive line to be drawn? Some portions of the animal creation, so-called, have much in common with the vegetable. Trees and plants have much analogous to the animal creation. If we note the structure and life of a tree or shrub, we shall find it, in very many respects, analogous to animal life and structure. It is not locomotive; but in all else it has close analogy with animal existence. It has a circulation of sap which answers the purpose of the blood of animals. In the winter this ceases: so does the circulation, and so do many other functions of hybernating animals during winter. The bear, the tortoise, and the dormouse, are, during the cold months, as dead as the shrub or tree. In summer, the leaves of trees perform an office similar to that of the lungs of the animal; and plants, deprived of fresh air, droop and sicken, and die, as the animal does when ventilation is very defective. Plants are poisoned, as animals are, by improper nutriment; and become diseased and unprolific, if their nutriment be too rich. As is the case with animals, vegetables not having locomotion do not need the sense of sight; but animals which live in the dark are the same. For instance, the mole is all but blind; and fish, found in rivers underground, are without the faculty of seeing, although they have the power of locomotion. In various instances animal and vegetable functions are intermixed. Some of the marine animals propagate by budding, whilst in flowers of trees, shrubs, and minor plants, we find the division into sexes, and male impregnation necessary to female fruitfulness. In some cases, vegetable life, after a certain period,

becomes animal life; and, in some rare cases, it is said to be the reverse.* In the American woods of Ohio, it is asserted, there exists an animal, which, after moving about until a certain period of the year, roots itself in the earth and assumes, for a time, vegetable life. To instances like these, the skilful naturalist could, of course, add many others, still more striking; but another consideration presses, to what conclusion do these facts point?

They appear, manifestly to point to more than one. The assertor of the material theory cannot but admit that, by all the facts is clearly indicated a long series of graduated life, commencing with vegetables, which, by imperceptible steps, becomes that which we distinguish as animal life. If we go further, and ask him if it be possible for life to exist without the power of receiving sensations to some limited extent, and if sensation can take place without simple consciousness (not reflective consciousness), what is he to reply? Can he, or any one else, conceive a living being to be the recipient of a sensation without feeling, at the same time, or being conscious of the sensation it receives? It appears to me impossible to separate sensation, felt, from a consciousness of that which *is* felt; and can any line be drawn between consciousness and mind? None, whatever. We can only conceive of consciousness of the simplest sort as a mental function, inseparably connected with all feeling; and as we, also, cannot conceive life to be without feeling, we seem irresistibly driven to the conclusion that life and mind are really identical; that one cannot be imagined, for a moment, to exist without the other: and that, in truth, they are synonymous terms.

From these conclusions I cannot understand why the spiritualist or immaterialist should shrink? Why should he so shrink? Upon either theory, we have a graduated scale, commencing with the simplest organic living forms, and ascending upwards to man. It is, surely, just as easy to conceive a graduated scale of immaterial being, commencing with beings capable only of one sensation, and ascending, by steps imperceptible, up to the complex and many-gifted immateriality of man. It is as easy to conceive an *Ens sentiens*, capable

* American Philosophical Transactions, in a paper by the Rev. Mr. Collins.


only of receiving or conveying one or two sensations, as it is to conceive a limpet adhering to a rock, having only the sensations of hunger and its appeasement. If I am asked of what use I can conceive these minor immaterial existences to be, I answer I can conceive them to be of every imaginable use. Experience teaches us that which is beyond all denial, that every pleasure, in life, may be traced to the action of mind upon mind. I am speaking here, of course, of human society, the benefits of which spring either from the sympathy or collision of mind with mind. It is the entire deprivation of this constant mental action, the result of society, that renders solitary confinement the most terrible of all punishments: whilst a partial deprivation of it creates, in the human being, that painful weariness of existence, known as *ennui*. Thus, therefore, beginning at the top, human existence is, in fact and in truth, a system of ministration; each individual ministering a share of the happiness of other individuals, and being, in turn, ministered to, by the interchange of ideas which constitutes the real value of social life. The truly painful portion of life is, past doubt, the bodily and mental drudgery which is apart from the free interchange of ideas, and acts as an interruption and suspension of such interchange. I speak of the ordinary routine of life. That mind can, and does, inflict intense suffering upon mind no one ever doubted. But the real drudgery of human existence resides in the manipulation of that which we call matter. Its real value resides in the variety, and vividness, and description, of the impressions received, and to this all the rest is clearly subordinate and subservient. The power of continued application to an object is one of the requisites of human life. Without it nothing great can be achieved: and hence that discipline is enforced, which imposes on every man the labour of fulfilling the conditions under which he lives. He must provide the requisites of life. The discipline is, however, mental, ultimately, and in its final results, under any theory that can be devised. This discipline is the foundation, only, of human existence. The ultimate value resides in the action of mind upon mind, and resolves itself into a system of ministration as beautiful as it is admirable.

Thus, then, a system of immaterial philosophy appears to open out

itself, step by step, as we proceed onward. We see the high probability of mind being, in truth, identical with life. That is one step. This, if admitted, involves the admission of a scale of immaterial being, of which the lowest may be an *Ens sentiens*, or immaterial existence, capable of feeling and conveying one sensation only. And thus we may proceed, upwards, until we come to the highest *Ens cogitans*, man, capable of perceiving a variety of simple sensations, capable of memory, and capable of reflection and of ratiocination, which enable him to recombine them, apparently without limit.

If it be asked, as it may be, of what use are these minor immaterial beings?—I do not see much difficulty in replying—of as much use, to themselves, as a mollusc or a limpet; but, probably, of much greater use to other somewhat higher existences. We have already seen that the valuable portion of human life is wholly created by the action of mind upon mind. To this we owe all that is called science; all that is called literature; all that is called art. If then the life of man be clearly made up, for the most part, of a system of mutual ministration, is it not reasonable to infer that all living existence must, probably, be an extensive and complex system of the same kind? Instead of impressions being made on the higher orders of mind, through the strange medium of lifeless and insensate atoms, is it not more reasonable to suppose that they may be conveyed through the medium of the lower grades of immaterial being, which may thus act upon, as well as be acted upon by others, within certain assigned limits? That the lower living animals are intended to minister, to a certain extent, to the life of the higher, and especially to man's life, in this stage of it, experience shows. We need not any theory to teach us this. This the materialist will admit as readily as will the immaterialist. I only argue for a modification and extension of this administrative principle, already seen to exist.

It has been, over and over again, admitted that the end and aim of human life is nothing but mental discipline, with a view to a future. This is not denied. Nor can it be denied that this discipline is effected through mental impressions. Neither can it be gainsaid that not only do men minister to each other in the conveyance of the impressions that make up this discipline, but the lower animals of every



conceivable sort so minister; some directly, the rest indirectly. If we assume all these lives to be immaterial existences, this ministration is equally conceivable. It only becomes necessary to carry it further, and to assume that there are other more inferior *entes*, of which we have no direct knowledge, that carry out this ministrative system in its completeness, and convey to us not only the visible and tangible impressions of our own organisms, but the tangible and visible impressions of all we feel and see: and that this is true of all living things, as well as of man himself. Under any theory of existence the indications of this administrative process are very numerous. The phenomena, observed and recorded by geologists, abound in these indications. First come the indications of the simplest forms of life. To this succeed organisms somewhat more complex; and so on as if each epoch was a preparation for a more matured and complete system of life; and these phenomena are probably intended to teach us that we, ourselves, may only be instruments to bring about some state fitted for beings higher in the scale of mind than ourselves, whilst we step into a further stage of existence similarly prepared for us. For a series of material organisms we have only to substitute a series of sentient immaterial existences, similarly graduated, and the two theories so far are analogous.

Neither will it, I think, be denied that in the ordinary construction put upon phenomena, there is a good deal to shock our better notions of Divine benevolence which it is desirable to explain away if such explanation can be proposed and established. I allude to that constant waste of life which has caused Tennyson to paint nature as "red in tooth and claw," and hold up his hands in amazement at her deeds,

" So careful of the type she seems;
So careless of the single life ! "

Thousands, to whom the power of thus expressing their feelings has been denied, have felt as Mr. Tennyson feels as to this matter. It forms one of the most startling stumbling blocks of the material theory. Let such persons be once convinced that all these massacres, and all this blood, are phenomenal, merely, and the objection vanishes. Death, then, becomes only a change of scene; attended with some

pain probably, but not more than may follow various accidents short of death. It also appears to me sufficiently clear that, under a theory, such as I propose, there is room for the explanation of various facts entirely inexplicable by means of anything involving material existence. Amongst these are various phenomena connected with the human constitution already particularized; various others connected with chemical combinations, and others to which I have not particularly adverted, which are asserted to have been witnessed in India, where the secret of producing in the human frame, and in the frames of various animals, a state analogous to that of hibernating animals is asserted to be known to the Brahmins. For all these strange phenomena a system of ministration, by intermediate immaterial beings, may possibly account. Under any materialist hypothesis they cannot, as it seems to me, be explained.

The conclusions to which the foregoing reasoning, and the facts adduced as a basis for that reasoning, appear to lead, may be briefly and succinctly summed up as follows:—

I.—That the material theory is more destitute of certainty, by far, than the immaterial theory: inasmuch as we are certain of the existence of our own minds, and that we have mental preceptions and sensations; whilst we have not the slightest proof that these preceptions and sensations are either directly or indirectly connected with material substance or existence.

II.—That, therefore, the immaterial or spiritual hypothesis must be preferred, being self-proved by the consciousness of our own existence and our own identity.

III.—That further, the assumption that matter exists leads, under any definition of its nature and qualities, to absolute contradictions in terms, and to difficulties quite insurmountable and quite inexplicable.

IV.—That, consequently, therefore, the assumption of the existence of matter, however defined, must be abandoned; or else we must hold that a doctrine, which involves contradictions, may yet be true; an assertion, the admission of which would destroy the foundations of all human reasoning whatsoever, and produce a mental chaos.

V.—That, thus, we are inevitably driven to embrace some theory of spiritual existence; or we must be content to be without any conceivable idea of existence of any kind, and must, consequently, ignore our own existence also, in such case, which is manifestly absurd.

VI.—That the theory of spiritual existence is not inconsistent with our impressions, as connected with appearances: that it does not involve any contradictions, or insuperable difficulties; and that it is capable, probably, of affording explanations of phenomena, inexplicable under the assumption of a material creation.

VII.—That it places Divine Providence and Divine Benevolence in a light much less liable to objection than the hypothesis of material existence, and a material creation as commonly held to exist; leaving no ground, in fact, for such objections.

VIII.—That, by proving mind, or spirit, to be an absolute, positive, unique, indivisible, and sole substance, independent of space or time, or arrangement of parts, or organization of any kind, it precludes all doubt as to a future state and continuous existence after death.

IX.—That it destroys and renders impossible all atheistical notions or doctrines, inasmuch as it proves that the Creator is, immediately or ultimately, the Author of all our sensations, impressions, and perceptions of every kind and description whatsoever; and that their existence cannot possibly be accounted for save by attributing them to Divine action.

X.—That, therefore, without interfering with phenomena in the slightest degree, or with men's acts, duties, or responsibilities, it establishes a basis for a spiritual and immaterial philosophy, apparently capable of further inductive proof, with regard to the mode and means in which and by which impressions are conveyed to us: with regard to the origin and cause of various bodily phenomena, hitherto inexplicable, and with regard to other phenomena connected with material combinations (so-called) equally difficult to be explained.

WORKS BY THE SAME AUTHOR.

- SIXTY-FIVE SONNETS, with other Poems, small 8vo. 1818. Baldwin, Cradock, and Joy, London.
- THE ITALIAN WIFE, a Tragedy, 8vo. 1823. William Blackwood and T. Cadell, Edinburgh and London.
- BABINGTON, a Tragedy, 8vo. 1825. William Blackwood and T. Cadell, Edinburgh and London.
- REMARKS ON SOME POINTS OF THE CURRENCY QUESTION, AND ON THE MONEY PANIC, 8vo. 1826. Baldwin, Cradock, and Co., London.
- LETTERS ON THE PETITION OF THE NEWCASTLE CHAMBER OF COMMERCE, 8vo. 1828. Thomas and James Hodgson, Newcastle.
- DIOCLESIAN, a Dramatic Poem, small 8vo. 1829. Hurst, Chance, and Co., London.
- A LETTER TO ALL THE FRIENDS OF PARLIAMENTARY REFORM ON THE APPROACHING CRISIS, 8vo. 1830. Ridgeway, London.
- CAIUS MARIUS, the Plebeian Consul, a Tragedy, 8vo. 1836. John Macrone, London.
- A LETTER TO JOHN HODGSON HINDE, Esq., M.P., ON THE VOTE BY BALLOT, 8vo. 1836. E. Charnley, Newcastle.
- NORTHERN LIGHTS. Jeux d'Esprit, published in "The Northern Liberator," 3 volumes, 8vo. 1838, 1839, and 1840. Newcastle.
- THE TRUE LAW OF POPULATION. 1841. Third and enlarged Edition, 8vo. 1853. Smith, Elder, and Co., London.
- HYMNARIUM ANGLICANUM; or Ancient Hymns of the Anglican Church, Translated from the Latin of the Salisbury Breviary. 1844. Rivingtons, London.
- THE COQUETDALE FISHING SONGS; with some account of the Authors. 8vo. 1852. Wm. Blackwood and Sons, Edinburgh and London.
- ESSAY ON MUNDANE MORAL GOVERNMENT, 8vo. 1852. Wm. Blackwood and Sons, Edinburgh and London.
- FINANCIAL, MONETARY, and STATISTICAL HISTORY OF ENGLAND. 1847. Second and enlarged Edition, 1859, 8vo. Effingham Wilson, London.
- THE POLITICAL LIFE OF SIR ROBERT PEEL, 2 volumes, 8vo. 1856. Smith, Elder, and Co., London.
- THE EVE OF ST. MARK; a Romance of Venice, 2 volumes, 8vo. 1856. Smith, Elder, and Co., London. 2nd Edition, 1860.
- WHY IS MONEY SCARCE? The question solved in a Letter to Thos. John Taylor, Esq., 8vo. 1857. Smith, Elder, and Co., London.
- A LETTER TO THE DUKE OF NORTHUMBERLAND ON THE ANCIENT MUSIC OF NORTHUMBERLAND, 8vo. 1857. Smith, Elder, and Co., London. Oliver and Boyd, Edinburgh. A. Reid, Newcastle.
- CRIMES OF THE WHIGS; or a Radical's Reasons for supporting the Tory Party at the next General Election, 8vo. 1864. Wm. Blackwood and Sons, Edinburgh and London.
- THE TOUCHSTONE; a series of Letters on Social, Literary, and Political Subjects, 8vo. 1863. Hardwicke, London.
- THE WAR, THE BALANCE OF TRADE, AND THE BANK ACTS; in a series of Letters, 8vo. 1866. Effingham Wilson, London.
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